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The 1976 Study of US Army Libraries recommended that the technical processing functions of each Army library be consolidated or centralized at the installation level. "Integration of New Technology in Army Libraries" determined the feasibility of installation-level networking of technical processing activities, and develops the means through which new technology can be integrated into Army libraries. Site visits to Fort Belvoir, Virginia and Aberdeen Proving Ground, Maryland, libraries gathered information that detailed current library technical processing operations for monographs,

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serials, and technical reports. Library automated turnkey systems and alternative configurations for consolidation were examined. Based on gathered data, a cost model was developed and applied to decentralized, installation-level,and command-level technical processing. Recommendations include projected organizational, staffing, and budget requirements, and an implementation plan for installation-level consolidation.

INTEGRATION OF NEW TECHNOLOGY IN ARMY LIBRARIES

Final Report

Contract Number MDA903-81-C-0591

Prepared by: Janine Reid
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The views, opinions, and findings contained in this report are those of the authors and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation.

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EXECUTIVE SUMMARY

The Army undertook the study of the integration of new technology in Army libraries to determine the feasibility of introducing new automation techniques to Army library technical processing activities, to examine and recommend appropriate systems and configurations of library automation for the Army, and to determine costs of implementing these recommendations.

By introducing this new technology to libraries, the Army will increase the efficiency of technical processing functions and also increase the exchange of resources between Army libraries, thus increasing the resources available to each library, while at the same time increasing services to the user.

Study Methods

The study had two phases. The first phase was gathering information at two test sites. The second phase was analyzing the information and making recommendations. Fort Belvoir, Virginia and Aberdeen Proving Ground, Maryland (APG), were chosen as these sites. Working Committees were established to assist the project team in gathering data. During the site visits seven libraries at Fort Belvoir and eight libraries at APG were examined. Using an interview guide, information was obtained including (1) number and types of personnel in each library, (2) number of hours spent in technical processing, (3) types of files kept, and (4) various library statistics such as the number of items ordered, received and cataloged. In each library technical processing activities were documented and flowcharted. From all of the information, a cost model was developed. This model was used to estimate costs for establishing alternative configurations (decentralized, installation-level and command-level) for integrated automated technical processing. In addition,

fourteen automated library systems, with applicability to technical processing, were examined.

Recommendations

The following recommendations and implementation plan provide for centralized technical processing activities and increased access to library information for the user, while retaining the individuality of the libraries in each system.

There are three categories of recommendations: major, additional and auxiliary.

Major Recommendations

- Establish installation-level Technical Processing Centers (TPC), using an integrated, minicomputer-based turnkey library automated system for each installation. Select the vendor by issuing an RFP.

  Place the TPC under the supervision of the chief librarian of the host library, to be determined by the post commander. Staff each TPC with a systems librarian, catalogers, acquisitions and cataloging technicians, and a clerk. Set up support agreements for personnel and funds between libraries on the installation and the TPC to support the TPC. Provide the TPC with space to accommodate staff, equipment, and library materials.
- Retain TRALINET.
- Establish a Department of the Army level office under the auspices of the ALMO for the purchase of serials and other common library materials.
- Retain the Corps of Engineers bibliographic network.
- Examine the most effective network possibilities for installations with single libraries.

Additional Recommendations

- Phase in the incorporation of new technology.
- Produce an installation union list of serial holdings using OCLC's Union List service.
- Use a bibliographic utility, such as OCLC, for cataloging monographs and serials. Use existing cataloging (OCLC, DTIC, NTIS, etc.) whenever possible for technical reports.
- Convert all catalogs into machine-readable format and enter all records into the installation's online catalog.
- Cease card production. The online catalog obviates the need for card production.
- The ALMO should work with SARDA in the effort to obtain DA acceptance of computer-produced facsimiles of government procurement forms.
- Libraries at the pilot project sites should provide additional services to users through production of specialized output from the minicomputer system.
- More reference service should be provided to library patrons. Terminals for public access to the online catalog would assist this.

Auxiliary Recommendations

- Each library should make a copy machine available for patron use and to facilitate responding to inter-library loan requests.
- The ALMO should continue its development of a standardized annual report form for use by all Army libraries.
- Establish a central translation information center.
- Discourage libraries from purchasing desk and office collections, including periodical subscriptions, except where essential to the performance of the mission of the agency.

- Offices should not establish collections unless supported by library accounts. Unofficial libraries should not be allowed to use official installation library resources to develop and maintain small collections.

Implementation

Fort Belvoir and APG should be designated test sites for a two-year pilot project for the consolidation of technical processing activities for all libraries on the two installations.

Year 1 - planning and coordination

Year 2 - contract advertisement and award; equipment installation

Year 3 - start-up operation of TPC

Year 4 - evaluation of Year 1 of operation of TPC

Year 5 - evaluation of Year 2 of operation of TPC

ACKNOWLEDGEMENT

The Project Team was guided in this study by a Study Advisory Group (SAG) composed of the Command Librarians of the participating Major Commands, field representatives from the installations and Federal Library Committee Representative. Members of the SAG were: Ingjerd Omdahl, Command Librarian, US Army Material Development and Readiness Command (DARCOM); James Bryn, Command Librarian, US Army Training and Doctrine Command (TRADOC); Abbott Martin, Technical Information Officer, US Army Corps of Engineers (OCE); Donna Griffitts, Administrative Librarian, Office of the Surgeon General (OTSG); Judith Arnn, Command Librarian, US Army Health Services Command (HSC); Rosalie Forst, Librarian, Ballistic Research Laboratory, DARCOM; Madge Busey, Library Director, Morale Support Library Branch, Fort Belvoir, TRADOC; Bennie Maddox, Librarian, Coastal Engineering Research Center, OCE; Margaret Smith, Librarian, Dewitt Army Hospital Library, HSC; and James Riley, Executive Director, Federal Library Committee.

In addition to thanking Dorothy Fisk, Director, Army Library Management Office (ALMO); Mary Bonnett, Administrative Librarian, ALMO; Don King, King Research, Inc. and the Study Advisory Group for their valuable assistance, we would like to express our appreciation for the contributions and cooperation of the members of the Working Committees. Working Committee members from Fort Belvoir were: Madge Busey; Bennie Maddox; Margaret Smith; Gloria James, MERADCOM; Natalie Kothe, Engineer Topographic Laboratory; and Fayleen Carey, Facilities Engineering Support Center. Those from Aberdeen Proving Ground were Rosalie Forst; Concetta Anclerio, Chemical Systems Laboratory; Joyce Watlington, Human Engineering Laboratory; Rose Marie Serbu, Main post library; Janice Weston, Ordnance Center and School; Patricia Pepin Medical Research and Development Command; and Krishan Goel, Environmental Hygiene Agency.

Janine Reid
Project Director

I. OVERVIEW

Background

Department of the Army activities operate more than 500 libraries worldwide. They include special or technical (including engineering), educational, medical, and general or morale support libraries. A survey of Federal libraries in 1972[1] reported that the Army spent about $24 million to support its libraries. The U.S. Army Audit Agency[2] raised questions in 1974 about the lack of coordination among libraries, cited fragmented library management, and was critical of duplication in library activities. In 1976, a comprehensive study of the Army library program was completed.[3] Two primary findings the study addressed were, 1) the need for consolidation and centralization of library operations, and 2) the need for improved coordination of Army libraries.

The 1976 study concluded that the Army was paying a high price to operate a large number of small independent libraries, in many cases located on the same installation. Both then and now, the larger Army installations have as many as five or more independent libraries, each serving different clientele and funded and managed by different Army organizations. This leads to unnecessary duplication of certain library functions, particularly in the technical processing area, when materials processed overlap.

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1 National Center for Education Statistics. Survey of Federal Libraries, 1972. Washington, DC: USDHEW, 1975.

2 US Army Audit Agency Report #HQ75-301, Section 10: "Consolidation & Management of Army Libraries." November 7, 1974.

3 Palmour, Vernon E., Marcia C. Bellassai and Louise Nyce. Study of U.S. Army Libraries. Washington, D.C.: The Adjutant General Center, July 1976.

The study recommended that all libraries at an installation become a local system in order to increase their services to users and to operate them more cost-effectively. The study recognized the need to centralize and expedite technical processing activities common to all libraries. It concluded that consolidation of technical processing should result in improved effectiveness and increased service to the user, while minimizing increased costs. Before centralizing, the study stated that test programs should be set up to integrate new technologies in Army libraries having different missions and command affiliations.

The 1976 study recommended that before consolidation plans be developed that the critical need for improved library coordination at the Department of the Army (DA) level be considered. The implementation of the study's recommendations included the establishment of the Army Library Management Office (ALMO), which was carried out in March 1980. The Army is now ready to implement a plan for the effective application of technology using a consolidated approach to library technical activites.

Current Study Objectives and Methods

The study, "Integration of New Technology in the Army Library System," was undertaken to develop the means through which advances in library automation techniques and capabilities can be integrated into Army libraries to make the technical processing of library materials more efficient. The feasibility of establishing an installation-based technical processing center was studied. This report presents a set of recommendations and an implementation plan for technical processing in an installation-based network of libraries that would be a first step toward wider networking activities for more expeditious resource sharing, information retrieval, and document delivery among Army libraries.

Technical processing is defined as the basic functions related to processing library material (monographs, serials, technical reports, microforms, etc.) from the time of request until the material is ready for shelving. These functions include:

- acquisitions
- cataloging
- indexing
- binding
- physical processing

Aberdeen Proving Ground, Maryland (APG) and Fort Belvoir, Virginia, were chosen as test sites for this study by the Contract Officer's Technical Representative (COTR) for several reasons:

1. proximity to the Washington, D.C. area;

2. variety of libraries represented: technical, educational, morale support, medical, engineering;

3. number of commands represented: Materiel Development and Readiness Command (DARCOM), Training and Doctrine Command (TRADOC), Corps of Engineers, Office of the Surgeon General, Health Services Command.

Basic tasks performed in conducting this study of technical processing at the two installations were to:

- Describe the existing library operations.
- Determine requirements for a new type of technical processing system.
- Examine automated systems to support technical processing functions.
- Analyze and evaluate existing library operations and alternative potential network configurations.
- Recommend alternative system(s) for technical processing of Army library materials.
- Develop implementation strategies for the recommendations.

The study was carried out by a project team of two librarians, an information scientist, a personnel specialist, and a statistician. A Study Advisory Group (SAG), made up of Major Command librarians and field representatives, was appointed by the COTR to guide and evaluate the project team's work. Working Committees, established at each installation at the suggestion of the project team, assisted the team in conducting this study. The Committees facilitated data collection, and educated the project team on Army policies and procedures. In conjunction with the SAG, the Working Committees guided the development of recommendations to reflect alternatives acceptable to the Army.

Site visits were made to libraries at Ft. Belvoir and at Aberdeen Proving Ground. Libraries were found in fifteen activities under five commands. In addition, personnel staffing three small collections at Ft. Belvoir were interviewed. Four principal types of libraries were surveyed (See Figures 1,

2, and 3). The site visits included interviews with personnel involved in technical processing, head librarians, and computer personnel. A profile of each library is contained in Appendix B. Details include statistics, files, personnel, hours spent in technical processing, and flowcharts.

Figure 1

ABERDEEN PROVING GROUND

LIBRARY	COMMAND	TYPE
Aberdeen Proving Ground Post Library (APG Post)	DARCOM	morale support
Army Environmental Hygiene Agency Library (AEHA)	HSC	medical/technical
Ballistic Research Laboratory Scientific and Technical Information Branch (BRL)	DARCOM	technical
Chemical Systems Laboratory Library (CSL)	DARCOM	technical
Human Engineering Laboratory Library (HEL)	DARCOM	technical
Ordnance Center and School Library (Ordnance)	TRADOC	educational
Test and Evaluation Command Library (TECOM)	DARCOM	technical
Wood Technical Library (Wood)	OTSG	medical

FORT BELVOIR

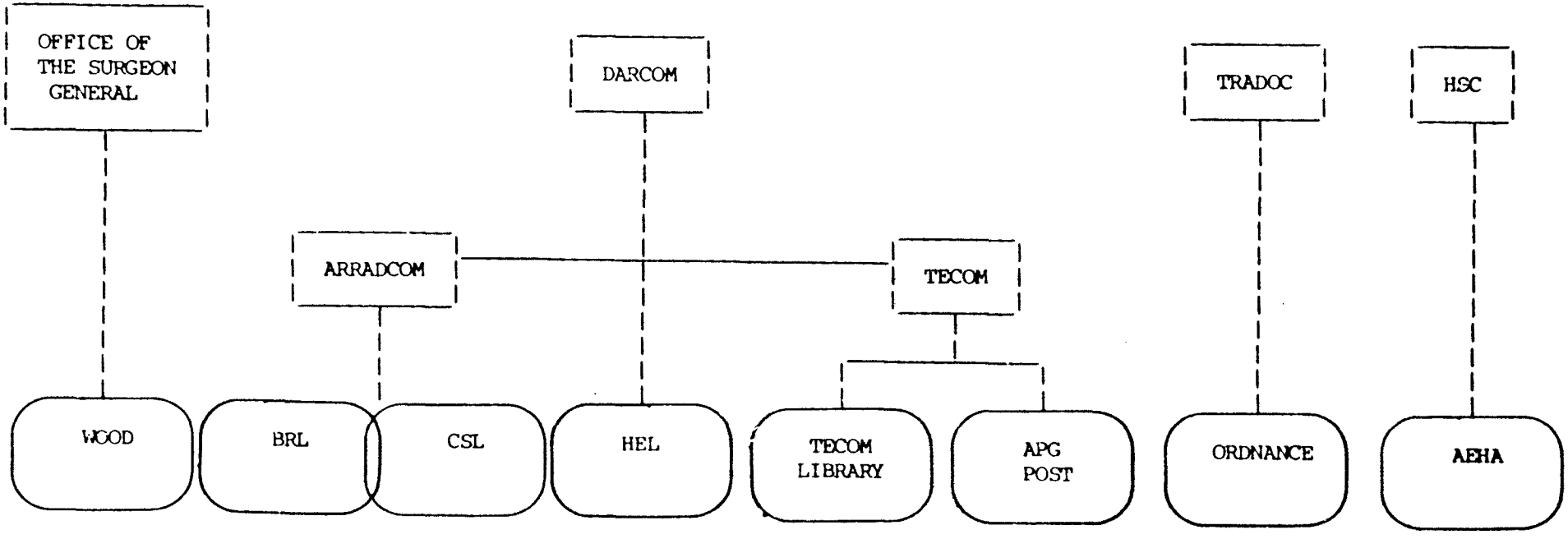
Army Coastal Engineering Research Center Library (CERC)	COE	technical
Dewitt Army Hospital Library (DeWitt)	HSC	medical
*Engineer School Library and Learning Resources Center (Eng School)	TRADOC	educational
Engineer Topographic Laboratories Scientific and Technical Information Center (ETL)	COE	technical
Facilities Engineering Support Agency Library (FESA)	COE	technical

*a special branch of the Van Noy Library

Mobility Equipment Research and Development Command Library (MERADCOM)	DARCOM	technical
Van Noy Library	TRADOC	morale support

FIGURE 2

ABERDEEN PROVING GROUND



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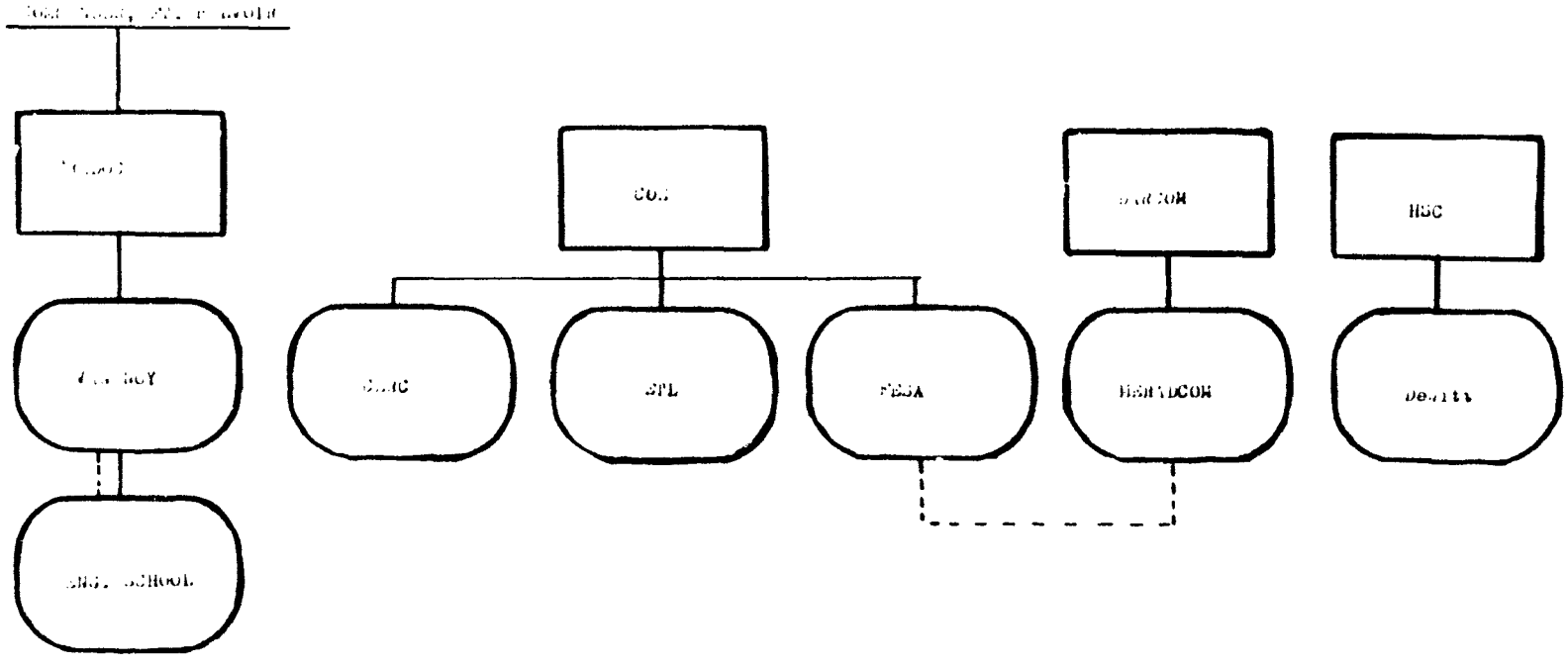

CF. BatWorld: Libraries of the host command and tenants

----: technical processing support

Visits were also made to the following Army and Federal agencies: Headquarters, Training and Doctrine Command (TRADOC) to study the TRALINET system based at Ft. Monroe; Headquarters, US Army Military District of Washington, Army Library Pentagon, and the National Library of Medicine, to review ILS; DTIC (Defense Technical Information Center) at Cameron Station, Virginia; and the Federal Library Committee. In addition, library automation systems with available or planned technical processing modules were examined, some on site and some through telephone interviews and review of documentation. All system suppliers were contacted by phone to provide up-to-date information on the availability of system modules.

Prior to the first meeting with the SAG, the project team developed detailed study plans, including an interview guide. (See Appendix A.) This interview guide was designed to provide both an overview of operations of each library and basic information specific to current technical processing activities. It includes information on personnel, (including grades, training and experience), staff time, and available automated data processing (ADP) equipment.

The project team met with the local Working Committees three times during the course of the study. The first meeting served to orient the project team to the installations of Ft. Belvoir and Aberdeen Proving Ground. In addition, the project team introduced the purpose and scope of the study to the installation librarians. The librarians were briefed on the type of information the project team would be requesting at personal interviews.

After the personal interviews were completed, the interviewers prepared forms which present data including number of personnel by title, series, and grade,

hours spent in technical processing activities, files maintained and used in technical processing, and general library statistics. (See Appendices B and C.)

At the second meeting the project team presented a preliminary analysis of technical processing activities and some generalized approaches to consolidation of technical processing activities. Feedback on the acceptability of these various approaches was received. Each librarian had the opportunity to review and comment on the project team's interpretation of his/her library's technical processing functions and levels of activity. After the project team presented aggregated statistical information, team members described criteria to be used to evaluate alternative technical processing configurations and systems.

At the third meeting the team presented preliminary results of the cost/benefit analysis, and discussed how alternative technical processing systems would operate if technical processing were consolidated.

Based on analysis of existing technical processing activities at both installations, and with the help of comments and recommendations from the Working Committees and the SAG, the project team developed the set of recommendations and an implementation plan for installation-level consolidation of library technical processing activities presented in this report.

Response to the 1976 study

Since 1976 the Army has made significant progress in incorporating recommendations from the Study of U.S. Army Libraries into the Army library program.

In addition to the establishment of the Army Library Management Office (ALMO), Army libraries have taken steps in library automation to provide for more cost-effective processing of materials and to establish various cooperative programs.

Automation projects introduced since 1976 that relate to technical processing include:

1) The Army Library, Pentagon, worked on the design of and has implemented the Integrated Library System (ILS) developed in conjunction with the Lister Hill Center, National Library of Medicine. Several other Army libraries are now in the process of requesting and/or installing the ILS, notably four ARRADCOM libraries and several TRADOC libraries, including Van Noy. At White Sands an RFP is in draft, intended to link an integrated installation-level system to TRALINET.

2) TRADOC has devoted considerable resources to promote command-wide networking primarily in the area of technical processing. The TRALINET system now acquires monographs for 14 libraries, and catalogs monographs and technical reports for 23 of the 44 TRADOC libraries it intends to serve when fully operational. A more detailed discussion of TRALINET is on pages 72 and 73.

3) A number of Army libraries have joined the FEDLINK system which provides access to OCLC, among other services. Libraries representing all of the commands have entered into agreements with OCLC for cataloging and inter-library loan. In addition, many libraries provide online reference services through DIALOG, SDC, BRS, and MEDLARS.

4) The U.S. Military Academy Library, West Point is in process of installing the GEAC system for an online catalog and circulation control; the system is scheduled to be operational by July, 1982.

5) Rock Island Arsenal has been using a minicomputer programmed by in-house staff, that handles acquisitions, circulation and technical reports.

6) Redstone Arsenal has had a multi-functioning system since 1964. Computer support is provided by Marshall Space Flight Center. A command-wide (DARCOM) serials holding list is being produced by Redstone.

7) The Corps of Engineers library network consists of 50 libraries and information centers, most of which are FEDLINK members. Approximately 30 libraries use OCLC with one or more terminals. Approximately 35 use other FEDLINK services, primarily online data base services.

In addition the Corps operates the following:

- Private File (FILE 982). File 982 is a COE Union Catalog, accessible online by all network libraries. The File is produced from the OCLC input of COE libraries. The OCLC tape records of all libraries have been merged and deduped according to network protocol. An additional field has been added to record holding information plus the local call number of holding libraries. Currently, the online catalog contains 62,000 full MARC records. Cataloging is distributive with certain back-up protocols. All bibliographic fields are searchable including subject.
- Army Engineers Report File (FILE 928). File 928 is a data base of COE generated publications, documents, reports, etc., not appropriate for entry into FILE 982. A standardized input format has been defined with eight key fields designed for each of input and retrieval. Network mode input must be registered and approved at headquarters. The data base is fully searchable and accessible Corps-wide.
- Bibliographic Data Base Management. Network libraries have the capability to offer clientele bibliographic data base management support as a library service. Libraries can, for inhouse project information, custom design and develop appropriate bibliographic support services.
- Bibliographic Support System (BSS). Utilizing the full MARC records of FILE 982 as the Master Bibliographic File, a Bibliographic Support System is being developed. The BSS will assist with acquisition, serials check-in, network inter-library loan and electronic mail, authority files, property accountability, network statistics and possibly circulation control.

> As with cataloging and bibliographic control, systems and services will remain distributive allowing as much local option as possible.

One of the objectives of the 1976 study was to "identify and develop policies for cooperative library activities aimed at reducing duplication of resources and administrative and technical activities." The 1976 study found little cooperative activity taking place among Army libraries and cited five barriers to cooperation; 1) attitude 2) lack of well-defined channels for resource sharing 3) complexity of the Army command structure 4) poor communications, and 5) lack of incentives. Since that time a number of cooperative library activities have been initiated at Ft. Belvoir and APG that include:

- acquisition service
- cataloging service
- reciprocal borrowing
- inter-library loan service
- data base utilization and reference service
- photocopying service

Some librarians spoke of a real lack of incentive to cooperate. Either they felt stretched to the limit as far as utilizing current resources and personnel, to accomplish their libraries' missions, or they were very content with current operations and felt that any change would interfere with their established operations. However, some librarians rely heavily on various cooperative activities which are described in the following pages.

The 1976 study found few formal agreements existing among libraries for sharing resources. In addition to snaring library materials, resource sharing implies encouragement of better communication among all levels of library managers, so that those providing library services can participate actively in decision-making. Currently there are written agreements for sharing resources among four Ft. Belvoir libraries, and two APG libraries. The agreements include transfer of funds to provide for services including acquisitions, cataloging, DTIC and other data base searches, and OCLC inter-library loan support.

As a direct result of the 1976 study the two independent TRADOC libraries at Ft. Belvoir (the Van Noy Library and the Engineer School Library and Learning Resource Center) were reorganized under a consolidation agreement with the Engineer School Library designated as a branch activity of Van Noy. Technical processing of monographs and serials for both libraries is performed at Van Noy.

The number of commands certainly has bearing on cooperative activities. Four major commands have libraries at Fort Belvoir; three commands plus the Office of the Surgeon General are represented at APG. Some funding across commands currently exists. Wood Technical Library (OTSG) transfers funds to CSL (DARCOM) and FESA (COE) transfers funds to MERADCOM (DARCOM) for library support services. The projects seem to be running smoothly; the libraries are providing efficient, effective service for which they are reimbursed.

Smaller libraries at APG look to the Ballistics Research Laboratory Library and the Chemical Systems Laboratory Library for additional resources before

going off post. This is probably due to the fact that five of the APG libraries are DARCOM R&D technical collections, and BRL and CSL have sizeable holdings oriented toward R&D. Ft. Belvoir does not have such well-defined channels for obtaining inter-library loan support on the installation; however, there is some sharing of resources among the technical libraries (the Corps of Engineers libraries, MERADCOM, and the Engineer School).

Of the fifteen libraries at Ft. Belvoir and APG, eight are OCLC users through the Federal Library Committee's Network (FEDLINK). Of these, five libraries have enough cataloging and inter-library loan activity to use the OCLC dedicated terminal six or more hours per day.

Most libraries with technical report collections have access to DTIC. Three libraries have secure terminals allowing access to classified data on documents. One library (BRL at APG) recently entered into DTIC's Shared Bibliographic Input Network (SBIN) program—a concept in shared cataloging similar to OCLC, and discussed in greater detail in Chapter II.

Another major cooperative program active in the Army is TRALINET, administered by Headquarters, Training and Doctrine Command (TRADOC) at Ft. Monroe. TRADOC libraries are required by TRADOC Regulation 1-2 to participate in this program whereby acquisition and cataloging will be done at Ft. Monroe for all TRADOC libraries. At the time of this study one APG library was fully participating. One Ft. Belvoir library was doing its own acquisitions and inputting its own cataloging into the OCLC data base; OCLC tapes were then dumped into the TRALINET system to contribute to the TRADOC libraries' union holding list. The TRALINET and OCLC systems are discussed in Chapter II.

The 1976 study suggested that a coordinated selection and purchase of common tools, reference works and core collections for similar libraries with related missions might improve staff utilization. In general, the project team did not find evidence of coordination of collection development among libraries on the same installation or with other libraries in the local area. The exception to this is a cooperative effort among the CSL, Wood, and AEHA libraries at APG who share serials holding lists and attempt to avoid duplication within their collections.

Staff shortages remain a critical problem at Ft. Belvoir and Aberdeen Proving Ground and may become a factor in promoting increased cooperation among installation libraries. Libraries that have unfilled authorized positions have a difficult time recruiting and retaining personnel. Reasons cited include:

- Operation of the Librarian Career Program
- Salary not competitive in light of education requirements
- Register is seldom open for librarians without subject specialties
- Poor location

Of all library activities, technical processing activities are most subject to disruption under staff shortages. Although all library operations suffer, reference, circulation and some other services must continue, while acquisitions, cataloging, and card filing often get relegated to the bottom of the list of priorities. Usually technical processing personnel are transferred to different locations in the library when another position is vacant. This results in backlogs, and ultimately, poor service to the user who will not receive materials and information in a timely manner.

II. AUTOMATION REQUIREMENTS FOR TECHNICAL PROCESSING

Use Of Technology In Libraries

With the rapid development of microelectronic technologies and the subsequent falling costs of hardware, a considerable amount of computing power is now within reach of many organizations previously unable to afford equipment. All but the very large libraries have until recently been unable to afford equipment, or to even consider automation. The trends in use of technology for the support of library operations, collection management, etc. have been from the application of large, general purpose mainframe computers to small, dedicated minicomputers and, more recently, microcomputers. The libraries that had access to large mainframe computers usually had to share the computer resources with other types of applications, such as accounting, payroll, inventory, etc. Unfortunately, this resulted in libraries receiving low priority at certain times, the consequence of which was a reduction in the potential effectiveness of the system to support daily library operations.

The most successful application of mainframe computers to library applications was with cooperatives of libraries, where the machine was dedicated to supporting their operation. This was how the OCLC* network emerged. Originally, a cooperative of nine Ohio libraries using a centralized mainframe computer to produce catalog cards, OCLC is now a major international cataloging utility supporting shared cataloging, catalog production, acquisitions and some serials control (more details of OCLC services can be found in Chapter II).

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*On-line Computer Library Center, formerly Ohio Colleges Library Center.

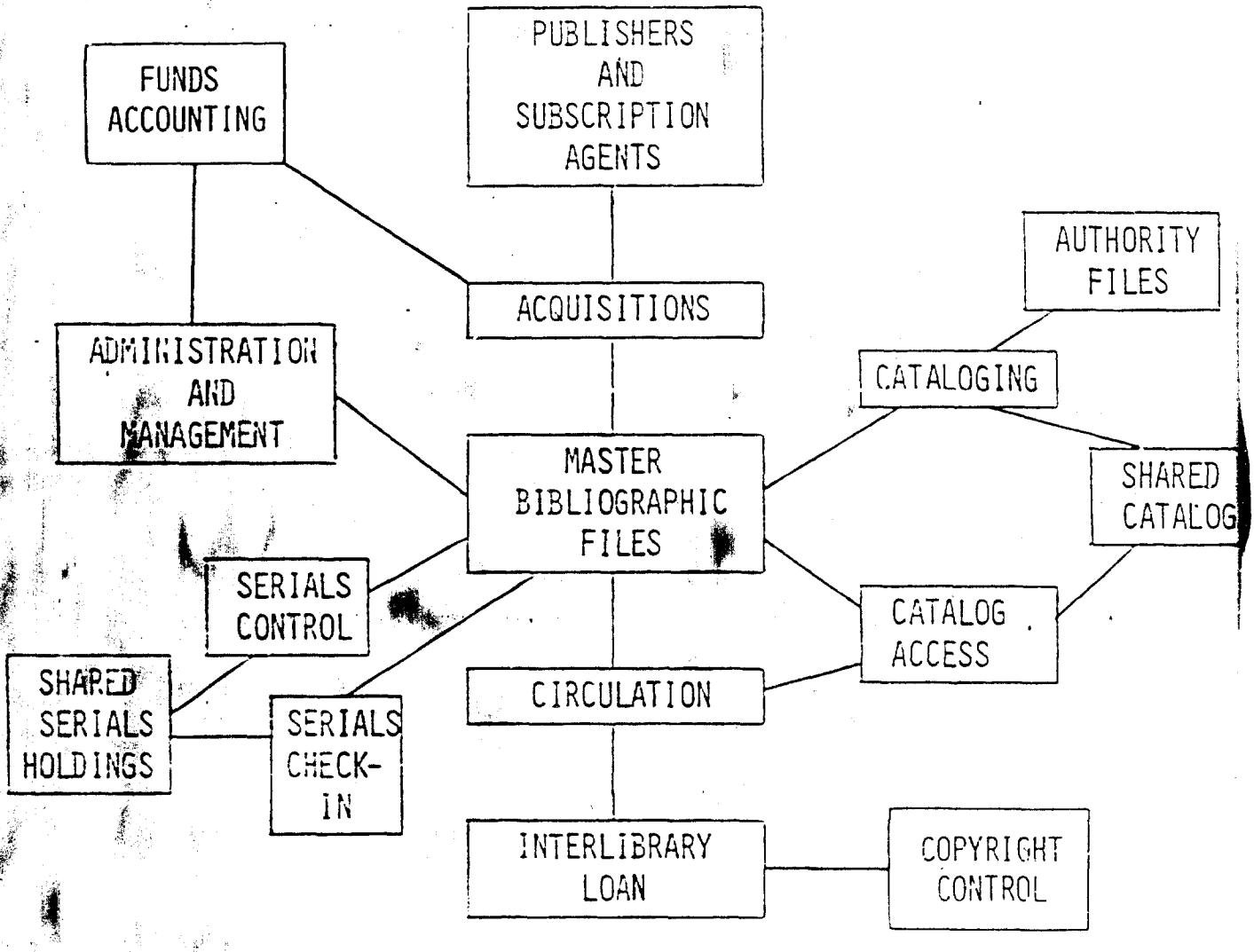
There have been two evolving types of capabilities based on computing technologies (both hardware and software) and related communications technologies. They are:

- bibliographic services or utilities
- library automation systems.

Each of the two types has a role to play in changing library environments. Rather than compete, the two are mutually supportive and complementary, although the boundaries between them are blurring. The bibliographic services have traditionally supported shared cataloging and catalog production but have begun to move into other areas, such as acquisitions, serials control and interlibrary loan. The library automation systems support the functions of circulation, catalog access and maintenance, serials control, acquisitions and management reporting. When first introduced into libraries, minicomputer-based systems were dedicated to a single function as a stand-alone (self-contained) system. Today, systems are being developed which combine many of the different functions. The systems of the future will be fully integrated systems, the concept of which is displayed in Figure 3. A truly integrated system implies that information to be stored is only input once even though it is used in many ways, and that system-wide functions such as monitoring, authorization control, indexing, sorting and searching are implemented only once.

The way in which librarians interact with the two types of capabilities is similar. In both cases, some form of computer terminal is used. This could be a dumb or intelligent terminal, or a microcomputer. Access to the

Figure 4



INTEGRATED LIBRARY AUTOMATION SYSTEM

bibliographic services (or network services) is always via remote telecommunications links (usually a telephone connection: dial up or dedicated), whereas access to a local library automation system can be via a hard wire link direct to the computer. This latter set-up is only feasible for short distance communications (up to about five miles), so a more remote library or branch will have to use a telecommunications link.

Bibliographic utilities provide space (temporary save files and permanent fields) within their huge centralized bibliographic files for local libraries to add data to support some technical processing functions. With many libraries simultaneously using one large central computer, access may be limited by the availablility of ports and the availability of unused space within the save files. Costs for using a bibliographic utility to support technical processing are quite reasonable, but full support of technical processing for an individual library cannot be expected to be achieved on a utility's central computer. Some of the utilities are planning for a distributed systems approach with the large central computer for bibliographic data linked to minicomputers in libraries for local files; this approach may bring the bibliographic utilities into a special area of the turnkey systems marketplace.

There are currently three large bibliographic utilities in the U.S.: OCLC, RLIN (operated by the Association of Research Libraries) and WLN (the Washington Library Network). Another service of direct relevance to Army libraries is that provided by the Defense Technical Information Center (DTIC) which has a technical report data base. Many of the Army libraries subscribe to OCLC and DTIC and a few to WLN.

There are three broad classes of alternatives available to the Army libraries to automate their technical processing activities other than shared cataloging. These three alternative classes are to:

1. Acquire and install a centralized minicomputer package.
2. Acquire and install a centralized mainframe computer package.
3. Carry out in-house development of special-purpose software.

The remainder of this section describes each of the alternatives in terms of the considered current state-of-the-art, and their implications for automated library systems in the Army.

Minicomputer Package

Minicomputers, introduced during the early 1960's, were initially developed as low-cost digital computers with a minimum of processing power, memory, and software support. However, it was soon recognized that minis had a potential use in a number of unrelated areas and that they should be adaptable to the requirements of each. This resulted in a number of general purpose minicomputers being developed and software being "unbundled." Prior to these developments, machines were sold for specific applications with software provided as part of the overall system package—all "bundled in" together.

There are three major factors responsible for the minicomputer's spread into the more general application areas of library automation, accounting, etc.:

- Evolution of more sophisticated operating systems in the late 1960's to early 1970's. These were disk based, real time, and timesharing.

- Emergence of peripherals (printers, terminals, large disks) with the same flexible environmental specifications as the minicomputers.

- Dramatic reduction in price, weight, physical size, and power consumption as a result of higher levels of integration in circuitry.

There are two main ways in which minicomputer-based systems are being used in libraries. The most widespread way is as a turnkey system. Such an approach delivers a machine that can handle clerical functions in circulation control, acquisitions, and technical processing. These turnkey systems are complementary to network services and can be combined with the cataloging and database networks to create very effective and economical "total" systems for individual libraries. The alternative approach involves using minicomputers to provide an in-the-library computing facility. In such an approach the minicomputer serves as a replacement for the large-scale computer traditionally used in system development and operations. The software for such systems is usually developed either by in-house programmers or by a software house, to serve one function at a time.

Library automation packages are available as discrete systems serving a single function; for example, circulation control, or as systems serving multiple functions; for example, cataloging, and acquisition. Although the ultimate goal of some of the vendors is to produce a fully integrated system serving all library functions, no such system is close to completion.

Based on the material collected, the following library functions and associated capabilities are currently supported by vendors of minicomputer-based software:

- **Acquisitions**

  pre-order searching
  ordering (including standing orders)
  claiming
  cancelling
  receiving
  routing
  management reports
  vendor and fund accounts
  financial reports
  vendor-independence (can order items from several vendors)

- Serials

  ordering
  invoice control
  serials check-in
  claiming
  binding control

- Cataloging

  full MARC formatting
  interfaces with OCLC, RLIN, etc.
  real time maintenance
  Boolean searching both within and across files
  production of labels
  item-in-process retrieval
  authority files

- The Catalog

  online catalog query by
    subject
    author
    title
    classification number
    card number
    ISBN/ISSN
    keywords

- Circulation

  borrower registration
  borrower status
  check-in
  check-out
  items status by author, title, call number, LC card number,
  ISBN/ISSN vendor number, subject
  reserves
  overdue notices
  reserve notices
  recall notices
  fines notices
  management reports
  copyright control

Each of the functions listed above exists as part of vendor-supplied turnkey packages. However, the packages that are evolving in the direction of "totally integrated" systems have these capabilities to varying degrees. There are about a dozen vendors today who offer a multi-function turnkey system (predominantly cataloging and circulation). They are discussed in more detail in Chapter II.

The turnkey system vendor, in addition to supplying the system, provides a number of services to the client. The installation and on-site testing of the system is completely handled by the vendor, as is maintenance. Vendors specializing in special purpose systems, such as library automation, will often provide superior maintenance services (e.g., faster response time) than either a mainframe vendor servicing general purpose systems, or an in-house maintenance group which may have to service a range of systems. Many vendors now have the capability to provide remote diagnostic services. Using a dial-in port to the system, diagnostic software can be run remotely and solutions found very quickly. In some cases, the client is advised to purchase, with the system, a complete set a spare parts (circuit boards, etc.) so that a diagnosis of a faulty board can be remedied by simply replacing it.

The vendor-supplied software will also be maintained. New software (updated versions of existing modules as well as new modules) will be issued (at very low cost) often as frequently as twice yearly. These updates (releases) will often require clients to compromise particularly in the area of operational procedures. The vendors will develop software that will satisfy the majority of clients, and organizations with special needs may have to compromise more than others.

One of the problems of acquiring a turnkey system, particularly one that is attempting to integrate functions, is vendor lock-in. The more integrated the system function the more dependent the client is on the vendor. The investment in system acquisition, data input and conversion (where applicable) make it extremely costly to move to another system in the future.

Mainframe Computer Package

Mainframes differ from minicomputers in that they are large, general purpose machines. Until very recently, the software available for mainframes (operating systems, database management systems, etc.) was by far superior to any minicomputer software. This situation is changing rapidly, especially with the larger minicomputers (VAX, PRIME 750, etc.). Because of the general-purpose rationale underlying the development of mainframes and because of the expense of the mainframe systems, they have not traditionally been used as the basis for library applications. The few exceptions are those organizations which already had a mainframe computer serving multiple functions (accounting, research, etc.).

Based on the material collected, the following library functions and associated capabilities are currently supported by vendors of mainframe-based software:

- Acquisitions

  pre-order searching
  ordering
  claiming
  cancelling
  receiving
  routing

management reports
vendor & fund accounts
financial reports
vendor's independence
documents indexed by vendor, library fund, order number, document number, author, title, subject
standing orders (subscriptions)
item-in-process file

- Catalog

full MARC-compatible catalog
OCLC/RLIN interface
real time maintenance
Boolean searching
authority files
library networking with local holdings files indexed by call number
built-in procedures combined with integrated authority files
help catch errors

- Catalog production

COM production
catalog cards
book labels
specialized bibliographies

- The Catalog

online catalog query by
  author
  title
  subject
  classification number
  publisher
  ISBN/ISSN
  LC card number
  local call number
  series
Boolean searching
keyword searching
truncation of search values

- Circulation

borrower registration
borrower status
check-in
check-out
circulation of all types of materials
item status indexed by borrower name, borrower number, document number, call number, author, title, keyword in title
reserves

recall notices
fines notices
interlibrary loan
management reports

- Serials

holdings information
recording
online access
COM or paper output

On the whole, these packages are considerably more integrated than available minicomputer-based packages. They are based on the concept of master bibliographic files accessed by the various functional subsystems.

The vendor-client relationship in the case of a mainframe computer is considerably different from the minicomputer environment. This difference is primarily caused by the general-purpose nature of the mainframe. The vendor will maintain communication with the computer center personnel but is unlikely to have any contact with the various groups of users of the machine. Consequently, the vendor is unlikely to develop the library automation package as a priority, or to customize it for individual libraries. The key priorities for the vendor tend to be the maintenance and development of the operating system and system utilities.

In-House Development

A library automation package developed in-house can be designed to run on either a minicomputer or a mainframe, and so the capabilities described in the two preceding sections could be included here. The major difference between those two alternatives and in-house development lies in the cost of bringing a

system to full operation. In-house systems development requires that systems analysts and computer programmers be available for the project. A large proportion of librarian time is required for systems design, particularly if the analysts are not familiar with library operations. Hardware may be shared with other organizational units or may be purchased by the library. The library may have scheduling and prioritization problems when computer resources are shared. The advantages of in-house development include the tailoring of software to meet the exact procedural requirements of the library system for which it is designed.

The support and upkeep of the system is also different from that accompanying a vendor-supplied package. The resources for support and maintenance must be found in-house. If the system is mounted on a timeshared mainframe, the library may find itself fighting for shared resources and may not be given a high priority within the organization. The ideal solution to this problem would be for the library to maintain a full-time computer systems specialist (analyst/programmer) dedicated to maintain library-related software, but once again the cost is usually prohibitive.

Acquisitions

Certainly this statement from the 1976 study still holds true today. "Timeliness in acquisitions is critical to meeting the needs of the library's users and fulfilling its missions."

Acquisitions requires:

- Continuous review of tools to ensure that needed materials are ordered
- Adequate continued funding
- Prompt ordering of materials as needed
- Responsive procurement and fiscal channels to permit prompt acquisition of needed materials
- Processing methods which make acquired materials available to users with the least possible in-house delay
- Keeping abreast of proposed program developments within the agency

Problem areas identified by most librarians at Ft. Belvoir and APG included:

- Total time lag in receipt of materials
- Local processing time lag
- Inconsistency in interpretation of procurement regulations
- Lack of understanding regarding sole source requirements by procurement officer
- Victimization by low bidder system
- Inability to effect multi-year contracts or standing orders
- Many administrative/time-consuming tasks to effect purchase
- Inability to time procurement actions to prevent gap in subscriptions

The Defense Acquisition Regulation (DAR 3-203 and 3-600) further amplified in DA Pam 28-30, states that multiple-year subscriptions, coupons, deposit accounts, blanket purchase agreements, imprest funds, basic ordering agreements and advance payments are all legitimate avenues for the acquisition of library materials. Local procurement offices at APG and Fort Belvoir vary in their interpretation of this regulation, particularly in the issuing of multiple-year subscriptions. In addition, unique problems are encountered in handling various types of library materials.

Purchasing Monographs

Two factors contribute to the problems encountered in local procurement of monographs: the small size of individual orders, and the redundancy of procurement processes.

Consolidation of purchasing activities promises correction of these problems. The Army should consider establishing an Army-wide purchasing facility for library materials. The Army also should consider establishing a procedure for central purchasing, production, and distribution of a monograph order list. Upon receipt and verification of an initial order for any monograph, the purchasing facility would determine from bibliographic data whether other libraries could be expected to want the item. Unless contraindicated, the facility would put online to all or selected appropriate libraries the full bibliographic data. Libraries would review these against needs and order simply by citing their identification code. Upon receipt of this information, the central purchasing office would prepare amended/additional purchase requests by entering the codes for the monograph and library for automatic acquisition.

Since publishers are often the sole source for monographs, the dollar value of consolidated purchase requests normally would not involve significantly greater requirements for competitive bidding than under current decentralization. Where local procurement is through vendors, the proposed consolidation should prove more economical through purchase in quantity direct from the publisher.

A new system presupposes automation with online communication among libraries, technical support offices, and the central purchasing facility. If the system

is not automated, difficulties resulting from distance and communication time may contraindicate centralization. The Army may wish to establish a small pilot operation, or monitor a command-wide program (e.g., as part of TRALINET) initially. Implementation of centralized purchasing Army-wide for monographs should be undertaken only after establishment of a permanent purchasing facility based upon successful trial of centralization for serials purchasing.

The project team also reviewed operations of an existing DA office for centralized procurement of monographs. This activity began after World War II as a result of the needs expressed during wartime. The Library Activities Division, Morale Support Directorate (DAAG-MSL) procures monographs and a few serially-issued reference materials (e.g., various investment services) for morale support libraries Army-wide; all commands are supported by this program. This service provides clothbound books for libraries, paperback kits for isolated troops without library services, and tear sheet lists (i.e., selection lists) to the libraries. DAAG-MLS supplied the following number of volumes in recent years: FY79 - 201,547; FY80 - 194,585; FY81 - 191,318 volumes.

An estimated 136 main libraries or a total of 271 libraries (including branches and bookmobiles) benefit from this service. Approximately 80-120 individual titles per month are distributed to the libraries; however, all libraries do not receive all titles. Distribution is based on the following categories of libraries and materials:

Category 1 - titles distributed to each library (an estimated 271 libraries)

Category 2 - titles distributed to main libraries only (an estimated 136 libraries)

Category 3 titles distributed to large installations only (an estimated 54 libraries)

Category 4 - titles distributed to special reference libraries (an estimated 12 libraries)

The primary role of the Acquisition Section of the Library Activities Division (DAAG-MSL) is title selection and development of specifications (including annual volume estimates and dollar estimates) for requirements contracts for procurement of monographs; the Defense General Supply Center (DGSC) in Richmond, Virginia, issues the contracts. Funding for DAAG-MSL operations and for purchase of materials is supplied by DA. The acquisitions unit is authorized to be staffed as follows:

Professional acquisitions librarian (supervisor)

GS-11 librarian (paperback selections)

GS-5 technician (invoice and discount checking)

GS-4 technician

Clerk-typist (half-time)

DAAG-MSL periodically has conducted cost-benefit analyses of centralized procurement of monographs. Considerable savings to the Army have been achieved through large discounts on volume purchases and savings in administrative time at the local level in libraries and procurement offices. The following list of discounts received currently provides an example of savings in purchase price; each discount figure includes a 2% discount for fast payment:

Trade, clothbound:
25+ copies - 44.3% discount
less than 25 copies - 40%

Trade paperbound:
200-299 copies - 50%
25-199 copies - 46%
less than 25 copies - 30%

Textbooks, clothbound:
200-299 copies - 37%
35-199 copies - 27%
less than 25 copies - 12%

Technical texts:
25+ copies - 52%
less than 25 copies - 42%

Library bindings:
25+ copies - 32%
less than 25 copies - 12%

Discount on miscellaneous types of materials - 10%. (This discount is given to the Army for materials on which no discount is given normally.)

It is evident from reviewing the discount rates that centralized procurement of monographs for morale support libraries provides significant savings to the Army.

Procurement by DAAG-MSL is concentrated on titles where the need by all or several libraries is obvious. This procurement is supplemented locally to meet the specific requirements of each installation. Common requirements for other types of libraries, with the exception of some reference and some serial titles, are not as obvious.

Purchasing Serials

Review of procurement practices indicates that centralization of purchasing processes for serials is both feasible and effective. Unlike monographs, serials can be purchased advantageously through competitive bidding involving major vendors (jobbers) and contracts in the hundreds of thousand or even millions of dollars. For example, the present contract between the Defense Supply Service - Washington (DSSW) and Turner covers some 175 DSSW customers and over $700,000 for serials procured for all activities in the Washington, DC area. (In practice, Turner is able to fulfill over 80% of all requests; the rest normally are purchased from the publisher.)

Centralization is not dependent upon automation or online communication between users and the central purchasing facility, although manual preparation of requests and communication by mail reduce timeliness and are less efficient. The project team recommends consideration of centralization for the purchase of serials. Large serial contracts would warrant careful preparation of contracts and evaluation of vendors. Bidders capable of meeting contract specifications usually will be major vendors operating on a national or international scale, with online access to publishers of most requested serials.

The experience of large-scale procurement operations such as GSA and DSSW is available to assist the development of an Army-wide system. While both have encountered problems, particularly in attempting to procure materials directly from publishers, the more efficient alternative of single vendor contracts has been economical and has resulted in user satisfaction.

A major problem in serials procurement is failure to receive issues (e.g., lapse of subscriptions). While centralization is not essential to the negotiation of multi-year contracting (e.g., initial year with option of two additional years) the size of a centralized contract, and the flexibility it affords, would be likely to achieve uninterrupted receipts.

The central purchasing facility could work with the Technical Processing Centers (TPCs) to set up common expiration dates for serials to facilitate timely service.

Open-ended (indefinite) contracts, guaranteeing the vendor a minimum dollar amount, would maximize the efficiency of working through a central purchase office. One of the advantages of the indefinite centralized contract is simplicity of operation. The scenario could be:

1. The library (or other users) identifies need for a new serial or, on an established schedule, usually at least six months in advance, the need to renew a subscription. The library notifies the TPC.
2. The TPC contacts the vendor to obtain data essential for procurement and prepares the purchase request. This is forwarded to the central purchase office.
3. The purchase office reviews and amends the request for conformity and forwards the order to the vendor.
4. The vendor forwards the request to the publisher.
5. The publisher forwards the serial (usually with the desired first issue, or without break in renewals) to the library.
6. The library and TPC complete processing, receipt and authorize pay. It is essential that technical office procedures permit timely identification of non-receipt and late deliveries.

Cataloging

Cataloging is describing an item so that present and future users can discern that item's content, appearance, source, and relationship to other items.

There are several alternatives to in-house original cataloging of library materials:

- continue status quo
- use a bibliographic utility for one's own records
- use a bibliographic utility to copy other library's records
- create a data base for one's own library

Volume of activity and quality of cataloging must be considered in determining which alternative to implement.

"Quality" cataloging is subjective. To one librarian quality cataloging would be brief bibliographic description of a piece allowing easy access by the user. The main entry would be chosen to reflect the most logical first access point according to the librarians' own judgement based on knowledge of the library's users. Another librarian may apply evaluation criteria determining quality cataloging based on rules established for machine-readable records. In this case attention would not be focused on choice of entry. Most fields are searchable, therefore the user would not need to know rules to decide how to find an item. Another important point to consider is the level of specificity in subject cataloging. In many libraries, assigning subject headings is the most important step in cataloging, in order to provide in-depth access to scientific information contained in monographs and reports.

The Library of Congress MARC (Machine-Readable Cataloging) records attempt to bridge the gap between machine-readable bibliographic record format and standard library cataloging rules, specifically the Anglo-American Cataloging Rules, 2nd edition, (AACR2). The MARC record is multi-purpose, and includes a number of elements peripheral to retrieving an item, such as whether or not the item is fiction.

Rules developed by Committee for Scientific and Technical Information (COSATI) are particularly well suited to cataloging technical reports. They serve to develop maximum standardization with a minimal amount of time. Ideally, the cataloger works with only the report in hand and with a few outside tools to complete the cataloging. The DTIC data base follows COSATI rules.

Both MARC and COSATI format were specifically designed so that cataloging records could be machine-readable. COSATI differs from MARC in that there are fewer data elements recorded, and that choice of main entry is not an issue. The cataloger considers only the type of information that is to be entered in a field. Generally, searchable data fields include corporate author, title, personal author, contract number, report number, and subject terms.

A major objection raised by librarians concerning adaptation to TRALINET, OCLC or DTIC, is that the quality of cataloging does not suit the individual library's needs. For example, OCLC records are not always AACR2 pure, especially in choice of main entry. Many libraries entering records into the system do not use LC's online authority record file; therefore, names are entered in a variety of ways. A library that is strict in its practice of applying AACR2 rules cannot simply copy OCLC records. It must carefully review each record and make revisions before the record is acceptable. Also,

inability to customize subject headings is a major drawback for some specialized libraries.

However, if the Army adopts standardized machine-readable records as a requisite for cataloging, a number of benefits will accrue:

- records from all libraries will be interchangeable
- less bibliographic verification and pre-order and pre-cataloging searching will need to take place
- union catalogs will be easier to develop because editing for consistency would not be extensive
- software can be shared
- networking will be facilitated
- service to the user will be improved.

Advantages of using available catalog data bases such as OCLC or RLIN include improved access to a substantially large number of cataloged records, access to information not previously available, faster throughput, and reduced staff time spent on pre-catalog searching, cataloging, inter-library loan, and bibliographic verification.

Technical Reports

"Technical report" describes a form of literature written to convey work done on a research project and directed to an audience of people working in the same or related fields. The technical report differs from monographs and serials in many ways. It can come in many sizes and shapes, can be produced quickly, and is always specialized in content.

Many Army libraries order, distribute and retain a wide array of technical report literature. Several libraries studied during this project catalog and retain thousands of technical reports yearly, both classified and unclassified. Two libraries have staff whose primary function is to maintain this body of literature.

The Army's primary source for acquiring technical reports is the Defense Technical Information Center (DTIC). Most libraries either receive reports through DTIC's Automatic Distribution of Documents (ADD) program, or order reports online. Also, libraries may acquire technical reports through reciprocal agreements from laboratories, universities, "think tanks," and trade, professional, and foreign organizations.

Technical reports are generally not listed in tools of the book trade. For reports not available through DTIC, librarians must search specialized indexes, both printed and automated. Note that some reports never appear in these indexes. The librarian must be innovative and creative in learning of a report's existence, source of publication, and availability.

Figure 5 is a sample of data bases available online that contain references to, and in some cases, abstracts of technical report literature.

Figure 5

Data Bases	Retrieval Services		
	DIALOG	SDC	BRS
National Technical Information Service (NTIS)	X	X	X
Educational Resources Information Center (ERIC)	X	X	X
National Agricultural Library (NAL/AGRICOLA)	X	X	X
Department of Energy (DOE)	X	X	X
Smithsonian Science Information Exchange (SSIE)	X	X	X
Medical Literature Analysis and Retrieval System (MEDLARS)			X
Meteorological and Geoastrophysical Abstracts (MGA)	X		
Library of Congress Cataloging from Information Dynamics Corp. (IDC/LIBCON)		X	
Congressional Information Service (CIS)	X	X	

In addition, some Government agencies provide access to their own publications, i.e., the Oceanic and Atmospheric Scientific Information System, OASIS.

The Government has taken steps to encourage uniform standards for control of technical reports. To aid in report control, some agencies require that a bibliographic data form be attached to the report (eg., DOD form 1473).

Clearinghouses are available that attempt to quickly index, abstract and disseminate technical reports. Printed indexes are often available. This bibliographic information could be used as catalog copy for those libraries that choose to catalog their technical reports.

Due to the highly specialized nature of technical literature, once received, rather than incorporating the report into the library's collection, it may be distributed to the patron who requested it or who would most likely be interested in it.

Based on its evaluation of the data, the project team determined that when catalog copy is already available, devoting time to do original cataloging and classification of technical reports, other than those emanating from within the library's own agency, should be seriously reconsidered.

However, the technical report has unique characteristics. It usually reports on research and development projects, thus its value is time-sensitive. A library should be selective about what it chooses to catalog and retain; the librarian should be aware that some reports retain permanent value. Some libraries have special requirements related to in-depth subject analysis of research documents; in these cases, available cataloging from DTIC or NTIS may need to be expanded.

Special Collections

Appendix F lists special collections identified at Ft. Belvoir and Aberdeen Proving Ground. Each type of material can be handled a variety of ways. Depending on the significance of the collection, a library may choose to treat a particular type of material at a level of processing different from that applied to monographs or serials.

Currently, computer centers are working on designing systems for particular library uses. Examples are the use of the Univac 1108 by Wood Technical Library and CSL to produce serials holding lists, and to control laboratory notebooks, and the development of Bookcat for BRL. Bookcat is an abbreviated form of an on-line catalog, allowing subject access as well as author, title, and call number retrieval.

The computer center could either design its own system, or a turnkey system could be purchased that could be tailored to the needs of a library's special collection. For example, rather than maintain cards, BRL's firing records could be entered onto a microcomputer. Each record would appear just as it does on the present card system. Such a system could allow for retrieval on any field and index term the library chooses to specify.

Retrospective Conversion

Retrospective conversion refers to the process of transferring old cataloging records usually the library's shelflist, to machine-readable format. Conversion of Army library shelflists would be done to support an automated circulation control module of an integrated system. Advantages of converting a library's entire holdings include having the facility to generate special bibliographies and having access online to one's own collection and those of other libraries on the same system. The Project Team did not project costs for retrospective conversion, because the process basically supports automation of circulation which is peripheral in scope to this project. However best estimates now are that it costs $.50 to convert each existing shelflist record.

When retrospective conversion of a shelflist is completed, the following actions could take place:

a) remove card catalogs from the individual libraries to provide additional space;

b) acquire additional terminals to provide for sufficient patron access to the online catalog;

c) acquire training aids to assist the public in use of the online catalog from the vendor or prepared by library staff;

d) the vendor should provide training to the appropriate local library staff in the operation of the circulation module; the TPC staff should be given an overview of the module's functions and capabilities;

e) implementation of the circulation module could now begin.

Conversion usually involves collection weeding, inventory, reviewing all cataloging records for accuracy and completeness, converting manual records into machine-readable format, and tagging data for various outputs. It is a time-consuming process and, therefore, it can be expensive. Often it is more cost-effective for a library to contract for the conversion, rather than do it in-house.

Union Serials Holding List

The definition of serial is, "1) anything published, broadcast, etc. in short installments at regular intervals. 2) a publication that is issued at regular intervals and is consecutively numbered. 3) published in installments or successive parts."[4]

The need for an installation-level union serials holding list was identified both at Ft. Belvoir and at APG. Advantages included:

- reduction in duplicate ordering of serial titles on same installation
- assistance in collection development
- maintenance of no growth policy of serial titles
- increased resource sharing among Army libraries, thereby minimizing the need for resources outside the Army
- avoidance, whenever permissible, of paying libraries for inter-library loan requests.

Currently, seven libraries at Ft. Belvoir and APG, individually produce periodic lists of serial holdings. Formats, frequency, completeness, and distribution vary. Location of a specific title on an installation requires look-up in each of the lists.

Discussions with APG and Ft. Belvoir librarians disclosed that some interlibrary loan currently takes place between installation libraries and that availability of an installation serials holding list would effect the channeling of more requests to installation libraries, rather than to other libraries. Since many libraries are beginning to charge for interlibrary loan, obtaining loans from other installation libraries would be a distinct

[4] Random House dictionary of the English Language, Unabridged Edition. New York: Random House, c1973.

advantage. Turnaround time for installation lending could be improved if messengers were used for delivery, since the post mail system often is slow. Turnaround time for loans obtained from non-installation libraries can be expected to take longer than installation-based lending since loans from outside sources are subject to delays both in the U.S. mail and in the post mail system.

The volume of interlibrary lending on an installation is determined to a large extent by the commonality of types of libraries on the installation. Technical libraries often can obtain needed scientific/technical journal articles from another technical library on the installation. Post, educational, and technical libraries often can support each other's interlibrary loan needs for journal articles in various subject areas which are peripheral in scope for the requesting library. Medical libraries would benefit least from an installation serials holding list, since many of their interlibrary loan needs are for biomedical journals which would not be held by a non-biomedical library. However, technical libraries with strong collections in biology and biochemistry would be able to supply some of the journal articles needed by the medical libraries.

The union serials holding list could be used as an aid in collection development. Each library could attempt to collect in a certain area, thereby lessening the imbalance between items loaned and items borrowed. What frequently happens is that small libraries borrow, while large libraries lend. Each library could agree to maintain serial titles in certain areas so that a wide coverage could be spread among all sizes of libraries. The libraries at Aberdeen and Ft. Belvoir have a no-growth policy for serials.

Titles are reviewed annually before re-ordering; those titles which are known to have low use often are not re-ordered and are replaced by new or other serials which are expected to receive higher use. Having access to an installation serials holding list would enable librarians to replace more of the low-use serials in their collections, if they knew that the title would be available elsewhere on post. Cooperative acquisition of serials would become a necessity if purchasing budgets were reduced or remained at current levels.

Retention of back issues, binding of serial volumes, and purchase of retrospective holdings in microform also would be affected to some degree by having an installation serials holding list. In some libraries, low use of older serials, space limitations in libraries, and lack of funds for binding or microform purchase are factors which influence which serial titles are retained in a collection for more than the three or five most current years. Librarians on an installation could begin a cooperative program for holding back runs of serial titles, with each library keeping the titles which received high use by its patrons.

Facilitating interlibrary loan would be another reason to maintain a serials holding list. Loan requests could be sent to the library that is known to hold the needed volume. Both the requesting library and the supplying library would save time in processing requests; the number of requests unfilled on the first try would be reduced for the requesting library, and the supplying library would not waste time handling unfillable requests.

The installation serials holding list would mark a beginning in the collection of data on serial titles purchased in common by Army libraries. The volume of titles purchased from a vendor could influence the price negotiations associated with serials procurement contracts.

Interlibrary loan: the copyright question

The Copyright Act of 1976 codifies the doctrine of fair use in Section 107, and in Section 108 it provides specific applications of the fair use concept to library photocopying for interlibrary loan. Section 107 indicates that the fair use doctrine does apply to photocopying by libraries and that fair use copies are not intended to serve as a substitute for an item available for purchase. Section 108 allows libraries to obtain a limited number of copies of articles through interlibrary loan, provided that the purpose or effect is not to substitute for purchasing a subscription to the particular title.

Since Sections 107 and 108 of the new copyright law do not provide specific guidelines for libraries to follow, publishers, librarians, Congressional subcommittee members, and the National Commission on New Technological Uses of Copyrighted Works (CONTU) met together to reach agreement on guidelines for library photocopying. These guidelines are contained in the Conference Committee report which was issued as House Report No. 94-1733. Some of the guidelines are summarized in the following paragraphs.

The new copyright law places on the requesting library the responsibility for not infringing on copyright. In any calendar year, a library may receive no more than five photocopies of articles published in a single serial title in the last five years. The copies may be of the same article or of five different articles. A library may not copy the major portion of an issue or volume. The copying restrictions do not apply to interlibrary loan requests for articles from serials published more than five years prior to the date of the request or to requests for non-copyrighted titles.

Also, the interlibrary copying restrictions do not apply (1) to titles that a requesting library has on order, or (2) to titles that a requesting library owns but does not have available for use when issues/volumes are missing, are circulating, or are at the bindery. The five-copy limitation is waived for these titles, since the requesting library is not obtaining photocopies on interlibrary loan to avoid subscribing to these serials.

The requesting library must maintain records and/or keep copies of its interlibrary loan requests for three years after the close of the calendar year in which the requests are made. The supplying library is responsible to adhere to the requirement that each interlibrary loan request for a photocopy of a journal article published within the last five years be accompanied by a notice (often a stamp) that the request was made in conformity with the copyright guidelines. Requests which do not conform to these guidelines should be rejected by the supplying library.

Libraries may deal with the sixth request to obtain a photocopied article from one serial title in a variety of ways. The photocopy may be made and a fee paid to a serial clearinghouse, or permission to make the sixth copy may be obtained from the publisher. In the case of interlibrary loan between Army libraries on a single installation, the problem of making a sixth copy could be avoided (1) by requesting loan of the particular physical volume or issue for use at the requesting library or for circulation to the patron, or, if appropriate, (2) by suggesting that the requestor visit the library that owns the title.

Since libraries must keep records of the requests that they make for photocopies of journal articles, the data would be available to identify titles with six or more requests in a year; these titles definitely should be considered for acquisition. The circulation modules of some automated library systems assist in this record-keeping requirement.

Cost of developing an installation serials holding list

Production of a serials holding list can be achieved by several methods: (1) as a printed product of a minicomputer-based integrated library system, (2) as a special product from a bibliographic utility such as OCLC, (3) as a product of a stand-alone, microcomputer-based serials control system, or (4) as a listing prepared on a word processor.

The last two methods were eliminated from consideration based on the following analysis. Methods 3 (stand-alone serials system on a microcomputer, such as "Check-mate" on a Radio Shack TRS-80) and 4 (word processor) would require initial input of all bibliographic, locator, and holdings data. These methods would not be cost-effective because of the high labor costs associated with them and because they represent a wasted effort--the data would not be in a suitable format for direct input either into an integrated system or into OCLC.

Methods 1 (integrated system) and 2 (OCLC) are similar to some degree. The same basic processing steps are associated with both methods: the OCLC data base would be searched to locate bibliographic records for each serial title held on an installation, bibliographic records would be created for all titles not in OCLC, and library locator symbols and holdings data would be added to

the bibliographic records. One major difference between the two methods is that with the integrated system, the labor costs for establishing the bibliographic records for serials and for inputting library symbols would be a cost of initial data input into the system in order to implement the serial acquisitions and/or the on-line catalog modules. The labor costs for the addition of the holdings data would be unique to the production of a serials holding list. With production of a serials holding list on OCLC, all the labor costs would be associated with producing the list. However, this data, extracted from OCLC on tape, could be read into an integrated system, thereby eliminating the need for direct data entry of serials bibliographic and holdings data at the time of initial data input into the system. Each library would have on-line access to its own holdings as well as the holdings of other libraries on the installation.

Equipment and other development costs for producing a serials listing on a minicomputer-based integrated system (Method 1)would be a function of the cost of whichever system the Army may obtain at a future time. Also, use of a minicomputer-based system would not allow for future development of an Army-wide union list of serials without incurrence of additional costs associated with processing a vast volume of data obtained from a number of local systems.

An advantage of using OCLC for the production of serials holding lists is that implementation of the project is not dependent on acquisition of additional ADP equipment or on establisment of a technical processing center.

The OCLC union list feature currently exists as an online display function within the serials control subsystem. OCLC requires that libraries conform to

the ANSI Standard for Summary Holding Data[5] which provides general guidelines for creating union lists that are standardized and compatible. This standardization forms a base for creating a national union list of serials. Special attention is given to the holdings statement area and full bibliographic standards represented in AACR2, MARC and the CONSER Editing Guide. This would allow each library having access to OCLC to input its own holdings. This level of decentralization puts the onus on the participating libraries to keep their holdings current--a factor that may contribute to the long-term maintenance of the system.

OCLC's off-line products are in development and prototypes will be available for examination by Summer, 1982. Paper output as well as microfiche and magnetic tape should be available by Spring, 1983. Union list groups are not limited to OCLC members. A unique 4-character symbol is assigned as a group identifier, and each individual has/is assigned a unique 3-character library locator symbol.

OCLC costs for developing an online union list of serials follows:

Programming costs:

1 hr. @ $34.00 x no. of non-OCLC members

5 hrs. @ $34.00 x no. of groups

4.5 - 5 hrs. @ $34.00 (cost incurred if a single library performs all data input)

5 American National Standards Institute. "American National Standard for Serial Holdings at the Summary Level." (239.42-1980) New York: ANSI, 1980.

Data entry costs:

local data record creation (holdings):

$ .25 x no. of titles x no. of libraries

enter non-OCLC titles: no charge

update holdings (estimate 20% update/yr.):

$.05 x .2 (no. of titles x no. of libraries)

Annual union list fee (based on number of libraries in group):

1 - 15 libraries: $300.00

(Note: libraries participating in a union list group do not incur additional charges when they become part of a larger group; therefore, development of an Army-wide union list of serials would not incur duplicate charges for Army libraries which are already in a union list group in OCLC.)

III. TECHNICAL PROCESSING ALTERNATIVES

Introducing automation to Army library technical processing activities should result in labor and materials cost savings, as well as benefits in areas of library operations affecting use and patron service. Potential benefits of consolidation of technical processing activities include:

- labor savings in individual libraries, affording better user services
- greater use of standardized rules and procedures
- increased opportunity to share staff expertise
- economies of scale
- opportunity to equalize processing loads
- aids in collection development
- greater access to Army resources for all users
- greater cost effectiveness
- basis from which to expand networking activities

Network Configurations

The project team determined that it was technically feasible to consolidate technical processing functions at various levels. Those identified were:

1. centralized
2. by type of library
3. by geographic region
4. by command
5. by installation
6. decentralized

Before a detailed analysis of alternatives to the current system of technical processing could be conducted, it was necessary to narrow down the many options available to the Army in designing an alternative technical processing system. The project's Study Advisory Group guided the study team in choosing the particular configurations on which to perform indepth analysis. The three configurations selected for analysis were (#4) by command, (#5) by installation, and (#6) decentralized. A brief description of each possible configuration for consolidation of technical processing follows.

Centralized

Under this option, all technical processing for all Army libraries would be done by one office, probably at the DA level.

This DA Technical Processing Center (TPC) would interact with OCLC, DTIC, and vendors to perform acquisitions as well as cataloging, plus related services for all libraries. The Study Advisory Group determined that, for now, assigning responsibility to one technical processing facility for all libraries would not be feasible. However, the team was instructed to investigate the functions a central office at the DA level could perform to alleviate library procurement problems, and how such an office would be used by libraries consolidated at some level.

By Type of Library

The libraries studied at Ft. Belvoir and Aberdeen Proving Ground represented most of the types of Army libraries found worldwide: medical and patient libraries, engineering and science, educational, morale support, legal, and other special. Technical processing facilities could be set up by type of library. Disadvantages to such a configuration include large geographic spread. This option was not selected for analysis.

By Geographic Region

The United States can be divided into any number of geographic regions for purposes of setting up technical processing facilities. Examination of a map of Army installations indicated that Army libraries are concentrated in the Eastern and Southeastern United States.

This configuration can be viewed as an extension of consolidation by installation. (See below.) Geographic consolidation was not selected for indepth analysis, but costs can be estimated by multiplying installation costs by the number of installations that comprise one region and decreasing the result by a factor of x% for economies in scale.

By Command

Using TRADOC's TRALINET as a model, the project team did a cost performance analysis of setting up a technical processing center at the command level. Libraries would send requests on-line to the facility. The facility would order and catalog materials. Materials would be shipped directly to the requesting library.

By Installation

One technical processing facility would be set up on each installation to do all ordering, cataloging, and physical processing of library materials for each library on the installation. Individual libraries would have terminals for bibliographic input and searching of the installation-based minicomputer.

Decentralized

Libraries would continue to do all of their own ordering, cataloging, and physical processing in-house. This configuration provides enhancements to the

current system. Terminals in every library for on-line acquisitions and cataloging would tie into a central minicomputer on the installation. Each library would have access to OCLC and, if appropriate, to DTIC.

Automated Library Systems

The project team identified automated library systems which currently support technical processing functions and those which plan to offer such support within the next several years. The systems identified in this section of the report are planned to be integrated systems; however, it will be several years before the development of such systems is achieved fully. Most of the systems selected for evaluation are minicomputer-based or will be minicomputer-based in the future; the exceptions are DTIC and the technical processing modules operating on the OCLC centralized mainframe computers. The systems are/will be able to support processing of all types of library materials, except for DTIC which supports processing of technical reports.

Discrete systems supporting a single technical processing function, such as acquisitions or serials control, have been excluded from consideration, since establishment of a technical processing center would require automated support of all technical processing functions.

Since OCLC is the primary bibliographic utility used by Army libraries, it is included for consideration as a mainframe system to support technical processing. Use of the other bibliographic utilities to support technical processing (RLIN, UTLAS, and WLN) has been excluded from consideration since none of the installation libraries at APG or Ft. Belvoir belong to these bibliographic networks. Army library membership in these networks is limited to two libraries in Alaska that belong to WLN. However, three of the North American bibliographic utilities either are marketing minicomputer-based systems (OCLC and UTLAS) or a vendor will be marketing a suitable

modification of the software to operate on a minicomputer (WLN/BLIS). There is no indication that the RLIN software will be modified to operate on a minicomputer.

For presentation in this report the systems are grouped into three categories based on developer: DOD systems (DTIC and TRALINET), bibliographic utilities and their associated systems, and vendor-supplied systems. The matrix presented in Figure 6 illustrates the present status of the technical processing modules of each system. Data is also supplied on availability of circulation modules. An overview of major advantages and disadvantages associated with each system can be obtained from the matrix. The number of currently operational modules which support technical processing can be considered a distinct system advantage, and the number of modules which are not yet available or which are partially available constitute disadvantages of a system. A written overview of each system is included in the following pages and contains additional information about the systems. Any mentioned need to re-key data is an indication that a system is not yet fully integrated.

It was difficult to obtain pricing information from system suppliers. Vendors were reluctant to commit themselves to any kind of estimate because of variability of circumstances that would affect prices: for example, hardware purchased in volume would allow for greater discount rates; conversely, enhancements to the vendor's current system may raise prices. Nevertheless, an attempt was made to be more precise in the range of pricing. A letter was sent to fourteen vendors requesting pricing information specific to the configuration recommended in this report. The letter, list of addressess, and a sample of the responses are in Appendix H. The responses confirm the fact

Figure 6

AUTOMATED LIBRARY SYSTEMS

Source:	Acquisitions	Serials Control	Online Catalog	Online Interface with OCLC	Circulation
DoD Systems					
DTIC	DoD reports	--	somewhat	--	--
TRALINET (Army - TRADOC)	(OLAS)	union list; acq.: '82	somewhat (OCLC)	(tape only)	RFP for ILS circulation [Ft. Bliss]
Bibliographic Utilities and Their Associated Systems					
OCLC	YES	ordering and check-in; claiming '82?	somewhat	Not Applicable	--
OCLC/ CLAREMONT	YES	ordering and check-in	YES	YES	YES
UTLAS/LCMS	Summer 1982	1983	YES	--	YES
WLN/BLIS	YES	ordering	YES	(tape only)	1983
Vendor-Supplied Systems					
ADVANCED DATA MGT	Late '82	Fall '82	YES	--	YES
CINCINNATI ELECTRONICS	Late '82	Summer '83	Early '83	YES	YES
CLSI	Summer 1982	1983	YES	YES	YES
DATAPHASE	Fall 1982	ordering: Fall 1982	YES	YES	YES
GAYLORD	Summer 1982	Summer 1982	--	YES	YES
GEAC	YES; to be reworked--late '82	ordering; full: '83	1982	YES	YES
ILS	198?	check-in	YES	YES	YES
INFORONICS	on-order file; '83	some; acq.: '84	YES	(tape only)	Summer '83
RINGGOLD	YES	ordering	198?	YES	YES
SIGMA DATA	YES	ordering	YES	Fall 1982	YES

that it is indeed difficult to obtain firm prices for such a system without issuing an RFP. The vendor responses also concur with the price estimates used in the cost models for projecting set-up and operational costs of an automated technical processing system.

Defense Technical Information Center

The Defense Technical Information Center (DTIC) is a clearinghouse for the acquisition, storage, announcement, and dissemination of technical reports and documents generated by research, development, testing, and evaluation projects sponsored by the Department of Defense. Since 1963, DTIC has been using a mainframe computer with random access capability. Currently the computer facility uses a UNIVAC Model 1100/82, a UNIVAC 1108 for off-line and batch processing, and a UNIVAC 418 for input/output processing.

Defense and associated contractor researchers are required to deposit information and documents, both classified and unclassified, into DTIC data bases. Eligible users of DTIC include research and development activities within the United States Government and their associated contractors, subcontractors, and grantees with current government contracts. Some collections contain proprietary data or information compiled for the specific purpose of Department of Defense management decisions which are made available to DOD components only.

DTIC operates four data bases:

R&D Program Planning Data Base. This is a repository of program planning documentation at the project and task level. This is a readily accessible management information program available to DTIC military users.

R&T Work Unit Information Systems (WUIS) Data Base. This is a collection of technically-oriented summaries describing research and technology projects currently in progress at the work unit level. The data base includes information concerning the what, where, when, how, at what costs, by whom, and under what sponsorship research is being performed.

Technical Report (TR) Bibliographic Data Base. This is a collection of bibliographic citations to formally documented scientific and technical results of Defense-sponsored research, development, test, and evaluation. These reports are assigned an AD (Accessioned Document) number for announcement, retrieval, and request purposes, and are categorized into a two-level arrangement consisting of 22 major subject fields, with further subdivision of 188 related subject groups.

Independent Research and Development (IR&D) Data Base. This is a data base of information describing the technical programs being performed by DOD contractors as part of their independent research and development programs. This research is not wholly funded by a DOD agreement, therefore, it is considered proprietary information and is exempt from disclosure under the Freedom of Information Act under Subsection (b) 5 USC 552.

In addition to the four data bases listed above, DTIC operates the Shared Bibliographic Input Network (SBIN). This shared cataloging program allows participating libraries to enter original cataloging data for DOD documents not yet in DTIC. Primary participants in this program are agencies that generate reports in-house. SBIN allows DTIC to act as a DOD on-line catalog. Libraries can attach holding symbols; printouts are generated of individual library holdings. The SBIN program is also designed to provide support for local storage of restricted access material. DTIC provides training to users.

As a further refinement of SBIN, system requirements for the Local Automation Model (LAM) have been recently developed. The LAM will be a locally-based system designed to handle technical reports and other materials including those not eligible for DROLS input. No dates have been announced for availability of this local system.

TRALINET

The TRADOC Library Information Network (TRALINET) is a network of several types of libraries (educational, morale support, and technical) under one major command. TRADOC regulation 1-2, January, 1981, states that, "as a minimum, technical processing functions are to be consolidated". TRALINET has ten authorized positions: three GS1410-12, two GS1410-11, one GS1410-9, two GS1411-7, and two GS1411-6. In FY 1981 TRALINET provided cataloging for 23 libraries, and acquisitions of monographs for 16 libraries. A TRALINET objective is to include all 44 TRADOC libraries on a system that initially will provide cataloging, acquisitions, circulation, and inventory control. Three and one-half years were spent developing software for TRALINET. Currently TRALINET's data base, which operates on an IBM 4341, has over 60,000 records, 23,000 of which were entered in FY 1980.

Acquisitions

In FY 1981 a pilot program began for centralized acquisitions of monographs. Sixteen TRADOC libraries were chosen as test sites for this program. Using the electronic mail capability, libraries entered their requests on-line. TRALINET acquisitions technicians read this file daily. The information was rekeyed into Brodart's OLAS acquisitions system. Participating libraries transferred funds to Ft. Eustis. In addition, the test included combining acquisitions and cataloging, which means that cataloging was completed before the monograph was received. TRALINET found that a negotiated contract rather than relying on BPAs is necessary to accommodate centralized book buying.

Cataloging

TRALINET offers cataloging to TRADOC libraries through OCLC. All processing is done at Ft. Monroe, Virginia. Librarians complete a standard form for each title. Forms are sent to Ft. Monroe. TRALINET catalogers revise OCLC records, create new records if necessary, and add any information the library wishes such as additional subject headings. Products include cards and labels from OCLC, and Computer Output Microform (COM) union and local catalogs generated at Ft. Monroe. Subject access is available on TRALINET.

Currently the TRALINET data base has over 60,000 records. About 23,000 items were entered during FY 1980. A contractor began work FY 1982 generating cataloging through MiniMarc. The first few months were spent in making their data compatible with that already entered into the TRALINET data base. It is too early to fairly evaluate this service, or to measure its impact on the TRALINET data base.

Union Lists

The Library Periodicals Union List (LIPULS) was the first module developed. OCLC tapes are input into the TRALINET data base which is then manipulated to produce a union list of TRADOC libraries serials on fiche, local lists of serials in hard copy, and selected management reports. In addition the System Center produces a monthly accession list in hard copy, and local cataloging on fiche. All lists are indexed by author, title, and subject. This module is not yet fully operational.

No cost studies were available for the project team to review. However, costs incurred included programming, staffing, training, and equipment.

Bibliographic Utilities and Their Associated Systems

OCLC, Inc.

OCLC is the oldest and largest bibliographic utility. A number of Army libraries have obtained access to the system through FEDLINK and other networks. In addition to supporting shared cataloging and producing catalog cards, OCLC now supports acquisitions of monographs and serials, funds accounting, a shared name-address directory of suppliers, serials check-in, some management reports, and production of union lists of serials. OCLC is a useful tool for online pre-order searching since the presence of a library's locator symbol in a record indicates that a title is owned. OCLC is an online union catalog and does not function fully as an online catalog for individual libraries; each bibliographic record contains the call number assigned by the library which initially entered the cataloging data into the system. Due to OCLC's recent move to its new headquarters, system downtime has been unusually high during the past year.

The OCLC acquisitions subsystem became operational in 1981. OCLC mails the orders directly to vendors in most cases; however, libraries may specify receipt of particular categories of orders which require attachment of additional procurement documentation before the orders are forwarded to the suppliers. A committee of federal librarians is working to design a form for output by OCLC that will conform to GSA procurement requirements. One of the planned enhancements to the subsystem is online transmission of orders to selected suppliers. The acquisitions subsystem is in operation or will be in operation in the near future at a number of FEDLINK libraries; libraries in the metropolitan Washington, D.C. area include the National Oceanic and

Atmospheric Administration headquarters, the Interstate Trade Commission, the National Agricultural Library, the Department of the Interior, the Bureau of the Census, and the Department of Health and Human Services.

A limited number of libraries use the OCLC serials check-in subsystem. The claiming function may be available some time in 1982, and a date for completion of the binding control function has not been set. The National Agricultural Library (NAL) has been using the serials check-in subsystem for approximately five years. The major advantage to NAL in using the subsystem is that the check-in records are available online for search-only access by agricultural libraries across the nation. These libraries search OCLC to determine if NAL has received the serial issue that they are seeking on interlibrary loan; therefore, the serials check-in system actually reduces the number of unfillable loan requests that NAL must process. NAL staff indicated that online check-in in the OCLC subsystem takes longer than manual check-in, but that the reduction in loan processing makes the extra expenditure of time for check-in to be cost-effective in the overall operation of the library.

OCLC has begun in-house development of a minicomputer-based integrated library automation system, the Local Library System (LLS), that will support technical processing, an online catalog, and circulation control. Details of the system and projected dates for availability have not been released. According to an OCLC spokesperson, the system will be better integrated and contain more special features than the Claremont system which OCLC currently is marketing.

OCLC's Claremont Total Library System (TLS)

This minicomputer-based turnkey library automation system was developed by the Libraries of the Claremont (California) Colleges. The system currently supports acquisitions of monographs and serials, funds accounting, an online catalog, and circulation. The system terminals are hard wired to the OCLC terminal to provide linkage between the two systems. Report parameters may be specified by the librarian since the data base query language provides for flexibility of output. Serials check-in can be performed using the acquisitions module's capability to record receipt of individual volumes. However, the orders for serials as well as the related receipt information currently cannot be read out onto a tape for retention when the acquisitions file is purged periodically. The acquisitions module is not yet linked to the catalog module, so data transfer involves re-keying. The special search capabilities in the online catalog module include searching by subject, by call number, or by using partial Boolean operators to combine keywords from the author or title fields with subject headings.

TLS operates on the Hewlett-Packard 3000 series minicomputers. The six libraries of the Claremont Colleges and the Ontario (California) Public Library are the current users of the system.

OCLC has an agreement with Claremont to market TLS for three years, with an option to renew. OCLC probably will continue to market the system and will provide transition support for libraries who wish to change to OCLC's proposed Local Library System from TLS or another system.

UTLAS

The University of Toronto Library Automation Systems (UTLAS) is a major Canadian bibliographic utility. In addition to supporting shared cataloging, UTLAS also supports an online authority control system on its central computers. Since 1975 UTLAS has been working toward the development of a fully integrated distributed processing network. The minicomputer-based Library Collection Management System (LCMS) may function either as a stand-alone minicomputer system or as an integral part of the UTLAS centralized network. LCMS currently supports an online catalog and a circulation module; a highly flexible statistical facility is available to produce both standard and customized management reports. Planned system enhancements include acquisitions (Summer, 1982), funds accounting (mid-1983), and serials control (1983). At present, no interface is planned between LCMS and OCLC.

LCMS operates on Data General's Eclipse S/140/250 Series minicomputers and on its microNOVA MP 100/200 Series microcomputers. The Rochester (N.Y.) Institute of Technology is the only user of the system in the U.S. UTLAS has recently completed an agreement with a Japanese firm who will market LCMS in Japan.

WLN

The Washington Library Network (WLN) is a bibliographic utility serving the northwestern region of the U.S. and western Canada. Two Army libraries in Alaska have recently joined the network: Ft. Richardson and Ft. Wainwright. WLN is the only American bibliographic utility with a linked authority control

system, so it is relatively easy to make changes to MARC formats in implementing AACR2. In addition to supporting shared cataloging and authority control on its central computers, WLN offers its network users an acquisitions system, including funds accounting and serials ordering. An online catalog should be available to network users in the near future. The high-level systems software package provides for great flexibility in allowing users to establish their own reporting parameters. The DataPhase circulation system, described on page 82, is operationally compatible with WLN. The total WLN software package is available for purchase from WLN.

A commercial firm, Biblio-Techniques, also markets the WLN software under the name BLIS (Biblio-Techniques Library Information System). The system is available both as a software package and as a turnkey system. Currently the system operates on mainframe computers, but testing is underway to provide for operation on a large minicomputer system. An online catalog has been developed as an enhancement to the WLN software. OCLC tapes or MARC tapes may be used to create the data base, and WLN network users have the capability to transfer bibliographic data online. A circulation system is under development and is expected to be available before the end of 1983. No plans currently exist for creation of a serials module for check-in and binding control.

Users of the WLN software include the National Library of Australia and its network of Australian libraries, the University of Illinois, and the University of Missouri. The University of California at San Diego currently is testing the system.

Vendor-Supplied Systems

Advanced Data Management, Inc.

The Bibliotech library system was designed specifically for special libraries that need in-depth access to their own collections. These libraries often are corporate libraries with holdings which are proprietary in nature; therefore, the libraries do not participate in networks for interlibrary lending and other cooperative activites. The primary purpose of the system design is to support the information needs of the corporation's staff, in addition, the system supports many of the clerical functions of operating a library.

Bibliotech currently offers online cataloging, an online catalog, and a circulation system. Boolean searching is available, as well as searching for individual words in subject headings and in abstracts. An authority control module is operational. Special reports may be designed and generated by library staff since Bibliotech is based on a data base management system. The system is reported to be user-friendly. Acquisitions and serials control modules are planned to be completed by the end of 1982. The system operates on the Digital Equipment Corporation's PDP-11 series and on other larger minicomputers in that series; it also operates on IBM mainframe computers.

Bibliotech does not support the MARC format for bibliographic records, since its user group of special libraries does not require use of that format. If required, full MARC records could be stored on tape, and software could be developed to provide an interface to the bibliographic file. Currently no interface exists between Bibliotech and OCLC or RLIN; a future system enhancement will enable libraries to extract records from the files of national bibliographic utilities.

Bibliotech is offered as a software package only, but marketing it as a turnkey system is planned in the near future. No Federal government libraries are Bibliotech users at this time, but two military libraries (non-Army) currently are considering purchase of the system to meet their information/library automation needs.

Cincinnati Electronics

The CLASSIC library automation system currently consists of a circulation module with a direct interface with OCLC for transfer of a library's cataloging data into the system. A special feature of the circulation module is inter-library loan record keeping for copyright control. Full MARC records can be handled by the system. The data base query language allows for report generation by library personnel for non-standard reports. A word processing package is also available. The system operates on the Univac V77' series of minicomputers.

The acquisitions module is scheduled for completion in late 1982; it is based on an acquisitions system package purchased from Duke University. The acquisition of all types of library materials, including serials, will be handled by the acquisitions module. Serials check-in and other aspects of serials control are scheduled for completion by Summer, 1983. An online catalog module with subject access will be available early in 1983. The Boolean Search capability has been developed already.

No federal government libraries currently use the CLASSIC library automation system. Users include the State of Wyoming State Library System with a state-wide circulation system, and the Riverbend (Illinois) Library System which includes several public library systems and a corporate library.

CL Systems, Inc. (CLSI)

At present the LIBS 100 library automation system consists of an online catalog and a circulation module. Online interface with OCLC is available with use of a package developed by Innovative Interfaces, Inc.; interfaces with RLN, UTLAS, and WLN are being developed. A partial MARC record is transferred from the bibliographic utility to the LIBS 100 system; acceptance of a full MARC record is planned for a future software release. Both Boolean searching and authority control are expected to be operational before the end of 1982. Currently the acquisitions module is undergoing operational testing at two large library systems and should be ready for release by Summer, 1982. It will support single and standing orders and funds accounting; future enhancements will include connection to vendors for online ordering and vendor performance analysis. Serials control is scheduled for completion in 1983. A reports generator allowing librarians to develop reporting parameters online should be available by late 1982. One special feature offered in LIBS 100 is the Public Access Catalog, a terminal with a touch-sensitive screen which the public uses for searching the online catalog. The system operates on the Digital Equipment Corporation's PDP-11 Series minicomputers.

CLSI is the oldest and largest of the turnkey vendors. Over 400 libraries are users of the LIBS 100 system, including DOD's Uniformed Services University of the Health Sciences, the Department of Energy, the Department of Labor, the National Aeronautics and Space Administration, the D.C. Public Library System, the University of the District of Columbia, and the National Institutes of Health Library (which recently signed a contract to obtain the system).

DataPhase Systems

ALIS II (Automated Library Information System) currently consists of an online catalog with online interface to OCLC and a circulation module. An interface with WLN is available also. The system accepts the full MARC record. Phase one of the acquisitions module is scheduled for release in September, 1982; it will support ordering of serials and monographs, funds accounting, and semi-automatic claiming. The 3x5 ANSI standard order form or a pre-printed multiple form may be used as output. A claim default cycle for each vendor and currency conversion are two enhancements planned for release in 1983. A variety of reports are currently produced by the system, and a reports generator is in development to provide the capability to prepare customized output. An authority control module is planned as a future enhancement to the system.

Small libraries may obtain a version of the system that operates on the IBM Series/1 minicomputer or on the Data General Nova 4-X. Larger libraries would need the version of ALIS II which operates on the multi-processor system developed by Tandem Computers.

DataPhase is the second largest turnkey vendor. In 1980 it obtained a contract with the Chicago Public Library for a full online catalog and circulation control system to support 150 terminals initially, with expansion to 500 terminals. Other system users include the National Agricultural Library, the National Bureau of Standards Library, and the Harford County (Md.) Public Library System.

Gaylord Library Systems

Gaylord currently offers an automated circulation control system which has an online interface to OCLC. Management reports may be generated by the system. The system may be used online to request a title for loan from another branch. The library that is being asked to supply the material can send a message online to the requesting library to indicate whether the title will be supplied on loan. Technical processing modules (acquisitions and serials control) are expected to be ready for marketing by Summer, 1982. The acquisitions module will include ordering, funds accounting, and vendor performance analysis; direct access to vendors for online ordering will be a future enhancement to the system. The serials control module is based on a purchased software package which will be modified by Gaylord's in-house programmers. By late 1982 the system is scheduled to accept a full MARC record; it currently supports a partial record.

The system operates on a distributed basis. Stand-alone microprocessors (Apple Computers) process certain categories of data as part of daily library operations; at night other categories of data are processed by a mainframe computer and then downloaded to the microprocessors.

The Gaylord system is currently installed in twelve public library systems; the largest system is the Queensboro Public Library in New York City. At present, no federal government libraries use the system.

Geac

The Library Information System currently consists of an automated circulation module, an acquisitions module, and an online interface with OCLC. The acquisitions module is being revised; the new system will be tested in late 1982 and should be ready for general distribution in 1983. Acquisitions will support ordering for monographs and serials, funds accounting, currency rate changes, and a variety of management reports, including vendor performance analysis. An online catalog with Boolean search capability should be available for release in 1982; the system will be able to support full MARC format. A serials control module is scheduled for release in 1983. An interface with RLIN is currently being developed, and interfaces with UTLAS and WLN are anticipated in the future.

The system operates on Geac minicomputers. Two versions of the system are offered based on library size. The Geac 6000 minicomputer supports the needs of small libraries, while the Geac 8000 supports large library systems.

The U.S. Military Academy Library, West Point, is the sole federal library to acquire the Geac Library Information System. Other system users include New York University, Yale University, the University of Southern California at Los Angeles, the Alexandria (Va.) Public Library, the City of London (England) Public Library, and a consortium of libraries in Connecticut.

Integrated Library System

The Integrated Library System (ILS) is a library automation software package under development by the Computer Technology Branch of the National Library of Medicine's Lister Hill National Center for Biomedical Communications (NIH/HHS). The software is designed to operate on Data General Corporation's Eclipse series, Digital Equipment Corporation's PDP-11, and IBM Series/1 minicomputers. Several options are available for obtaining ILS. The software and user documentation may be purchased from the National Technical Information Service (NTIS), but it is necessary for a library to have systems staff or a contractor provide the additional systems work required to install ILS at a particular site. Two recently-formed companies provide special services to libraries that select ILS to fulfill their automation needs: Online Computer Systems, Inc. offers ILS as a turnkey system, providing the necessary systems support both to start-up the system and to deal with future systems problems. In addition to providing ILS as a turnkey system, Avatar Systems, Inc. provides a service which is particularly beneficial to small libraries: ILS is marketed as a shared system operated on Avatar's centrally-located minicomputers, with each library having access to its own data.

ILS currently offers an online catalog, serials check-in and routing, circulation, an interface to OCLC for transfer of bibliographic data to the master bibliographic file, and part of the authority control function. Each library may define which MARC tags and subfields it chooses to store locally. Some administrative reports are available. Future enhancements include acquisitions, full serials control, interlibrary loan, and a general report writing capability. Target dates are unavailable for completion of the

enhancements due to budget uncertainties at the Lister Hill Center. Libraries may choose to obtain the planned enhancements and any other customized software by contracting for their development with Online Computer Systems, Inc., or with Avatar Systems, Inc.

ILS was installed at the Army Library, Pentagon, in mid-1980. The librarians had worked closely with the systems development staff at LHC in designing the system, and the Library was the actual test site for ILS. Circulation was the first module to become operational; serials check-in, the online catalog, and the authority file function were phased in later. Automation of acquisitions is the next item on the Library's priority list, but no dates have been established. Cards are still being filed in the card catalog, but the catalog will be closed this year.

At the time of the project team's visit to the Army Library in January, 1982, the system was operating under software version 2.0 which needed some debugging. This new version of the software provided the library with online catalog access, a generalized patron registration form, and system acceptance of pre-printed labels or bar codes. The use of borrowers cards is supported by the system, but the Library had not yet implemented that feature. Software must be developed by LHC or a contractor in order to support acquisitions, the interlibrary loan function, and completion of the serials control and management reports modules.

The Library contracted with their applications software contractor for development of an interface program to download OCLC records into the Master Bibliographic File and a control program to provide for the operation of a hand-held bar code scanner. The scanner will be used for checking-out items

when the system is down. It is necessary to be able to support the circulation function during periods of system unavailability, since a current system limitation is that certain functions cannot be performed simultaneously. The scanner is very portable so it also will be useful for recording internal circulation of materials and for taking inventory.

Two features of the circulation module are particularly useful in this large, highly-used library. Items which are on carts and need to be shelved may be located by library staff for patron use; each cart has a special bar code label which is recorded in the circulation record as the temporary location of the book or serial issue. Also, the system provides statistics on check-out and internal circulation of each copy of each title in the system; this information may be used in determining if extra copies of a title should be purchased or if the title should be considered for weeding.

The staff at the Army library is very happy with their system. No additional staff was hired, and the librarians have learned to perform some simple programming online. Both the Data General minicomputer and the operating system have proven to be very reliable. The Library has three types of contracts to support the operation of ILS: contracts for hardware maintenance, operating system support, and software applications development. More simple printers need to be purchased so that users of the online catalog may print the retrieval displayed on the screen, rather than having to hand-write the results. The costs for hardware purchase and maintenance and for initial site preparation are included in Appendix E.

Another DOD library, the Naval Research Lab Library, has recently signed a contract to obtain ILS.

Inforonics

This library automation system currently consists of an online catalog and a portion of both the acquisitions module and the serials control module. The online catalog will support the MARC format for books. An OCLC tape of a library's holdings may be used as input to the system. Both Boolean and subject search capabilities are currently available in the online catalog module. The acquisitions module currently consists of an on-order file; order production and acquisitions management functions are scheduled for completion by Spring, 1983. The serials control module consists of on-order information, routing, and a union listing capability; control of serials acquisition is scheduled for 1984. The serials control module currently is not linked to the other modules. A circulation module is planned for operation by June, 1983. The system operates on the Digital Equipment Corporation's DEC-Systems 10 or 20 computers.

Inforonics is mainly a library service organization which maintains catalogs for over fifty libraries. The company is now marketing its systems. At present, users of the library automation system do not include any Federal government libraries.

Ringgold Management Systems

Ringgold offers the Nonesuch Acquisitions and Circulation Systems. The acquisitions module supports funds accounting and order and in-process control for monographs and serials. Call numbers may be entered into the acquisitions module after an item is cataloged; the system can generate accessions lists in

either author/title order or basic call number order. Online interface to OCLC allows full MARC format records to be added to the circulation module; partial MARC records are entered into the acquisitions module. Interfaces with RLIN and WLN also are available. Special management reports may be generated on demand. Future system enhancements will include a serials control system, full integration of circulation with the acquisitions module, and an online catalog.

The Nonesuch systems operate on the Wang Laboratories LVP, MVP, OR VS minicomputers. The Wayne State (Mich.) University Library System is a new user of the acquisitions system. Circulation system users are the Yakima Valley (Wash.) Regional Library System and the Leavenworth (Kan.) Public Library System. Lawrence-Livermore Radiation Laboratory Library (Calif.) purchased the circulation software.

Sigma Data

The integrated library system, DATALIB, currently supports acquisitions and funds accounting, cataloging, an online catalog, and circulation. An online interface with OCLC has been approved and is scheduled to become operational by Fall, 1982; currently all bibliographic data must be keyed into the system. Features of the acquisitions module include control of orders for serials and production of customized purchase orders. The funds accounting feature is being enhanced. Tagged records support online cataloging requirements, and up to 25 custom-tailored record formats can be produced. An authority file function is part of the cataloging module. Online retrieval includes the capability to search by keyword, call number, and subject; full

Boolean logic is supported. The circulation module provides copyright control for interlibrary loan. A number of reports are produced by the various system modules.

DATALIB operates on all of Data General Corporation's Eclipse series minicomputers. The system is marketed both as a turnkey system and as a time-shared system on central computers at Sigma Data's service center.

The libraries at the Executive Office of the President and Texaco, Inc. are using all components of the integrated turnkey system. Another turnkey system user will be the library at the Department of Justice. Federal libraries using the acquisitions module on Sigma Data's computers include Housing and Urban Development, the Federal Trade Commission, and the Department of Labor. This time-shared use of the system and the development of a data base for shared input of bibliographic data for acquisitions is supported by an FLC contract with Sigma Data.

IV. COST ANALYSIS OF TECHNICAL PROCESSING ALTERNATIVES

In this section, the three selected approaches for consolidation of technical processing are compared. These approaches are:

- Command level
- Installation level
- Decentralized

For comparative purposes, the costs of operating in the present mode were also calculated. With the range of activities performed in Army libraries the differences in technical processing volumes, staffing levels and equipment used across Army libraries and the types of materials processed by the Army libraries, a generalized set of models for computing the processing costs was developed. The actual implementation of the models was achieved using the data gathered from the libraries at APG and Ft. Belvoir. (See Appendix B). The generalized model developed therefore, assume that the range of Army libraries are similar to the range of those at APG and Ft. Belvoir, in terms of type, size, volume of activities, personnel, etc. The main reasons for using the modelling approach are:

- the models can be used to compare the technical processing costs of N* Army libraries

- the models can be further refined for groups of Army libraries by inserting data collected from those libraries

*N is the number of libraries chosen for the base models. For this study N=45.

- the framework of the model can be used for monitoring the technical processing activities of Army libraries by collecting the data on a periodic basis

- the models are potentially expandable to include other library activities, such as circulation control, interlibrary lending and borrowing, and reference.

The models were designed to be used in two ways. First, they can be used to calculate total costs of alternatives for all Army libraries. Second, they can be used by individual libraries to determine their own operating costs under different consolidation arrangements. These two approaches represent a "top-down" and a "bottom-up" approach to costing. An example of how an individual library might use the models is given on page 97.

In order that the comparison of the current technical processing costs with those anticipated under the alternative consolidation arrangements be consistent, the models were developed as follows:

The number of libraries at each level were defined as:

1) Command = 45

2) Installation = 7.5 (total at APG and Ft. Belvoir ÷ 2)

Consequently, the models calculated the technical processing costs for:

- the current operation of 45 libraries
- 45 libraries configured as decentralized
- 45 libraries configured as 6 installations
- 45 libraries configured as 1 command

The activity levels for this set of 45 hypothetical libraries configured in alternative ways were derived from those gathered from the 15 libraries at APG and Belvoir (multiplied by 3).

The next step in developing the models was to determine the various activities involved in technical processing. After careful consideration, it was determined that the most appropriate way to organize the activities was by the type of materials being processed: monographs, serials, and technical reports, although some of the activities relate to all types of materials.

The activities associated with monograph processing are:

- ordering
- receiving
- pre-catalog searching
- cataloging
  - original
  - via OCLC
- card filing
- physical processing

The activities associated with serials processing are:

- ordering
- check-in
- claiming
- routing
- binding

The activities associated with technical report processing are:

- ordering
- receiving
- pre-catalog searching
- cataloging
  - original
  - using DTIC
- card filing
- physical processing

Cost models were developed and employed for the three sets of activities.

The cost models of individual library operations were constructed by sub-dividing each of the activities above into fixed costs and costs that vary with amount of activity or quantitites produced (e.g., titles ordered, titles cataloged, issues checked in, etc.). The fixed and variable costs were further sub-divided into the following cost components: labor, equipment, supplies, communication, and the like. In order to construct the cost models, data gathered from the 15 APG and Ft. Belvoir libraries were costed (see Appendix C). The cost data included fixed cost items and variable labor component costs. Since the 15 libraries varied substantially in the levels of activity, the model merely established the relationship of amount of labor time expended as a function of quantities of items produced. This permitted determination and accounting for any economies of scale that might be achieved. For example, one might hypothesize that the units produced per hour labor might be higher in a large operation, say 5,000 titles cataloged per year, than a small operation, say 500 titles cataloged per year. Furthermore, a regression analysis provides a good method for analyzing differences between

APG and Ft. Belvoir libraries, among types of libraries (i.e., morale support, technical, medical, etc.) and grade levels of those performing the work.

An example of the simple regression model is given for ordering single items. The relationship between annual labor hours and items ordered per year is given in Figure IV-1 on the next page. Ft. Belvoir libraries are designated by Xs and Aberdeen libraries by Os. The simple regression equation (y=23 + .28x: where y is annual labor hours and x is items ordered per year) is estimated from the 15 libraries observed at Ft. Belvoir or APG. It is noted that there appears to be some economy of scale in that libraries having 500 items ordered per year have an estimated average hours per item of 0.33 and libraries having 5000 items ordered have an estimated 0.28 hours per item ordered. Three of the libraries appear to lie on the simple regression line, four are above and five below so that the model appears to fit the data well. It also appears that APG and Ft. Belvoir are not too different in terms of the model in that they both have observations above and below the line (albeit that all the libraries that have over 4,000 orders per year are Ft. Belvoir libraries). There do not appear to be differences by grade level or type of library.

There are three types of costs involved in the cost model:

- fixed one time costs
- fixed recurring costs
- variable (per transaction) costs

The fixed costs (both one time and recurring) are displayed in Table III-1 below [More detail of the cost components involved are shown in Table D-1 in Appendix D.] It is important to note that our fixed cost calculations did not

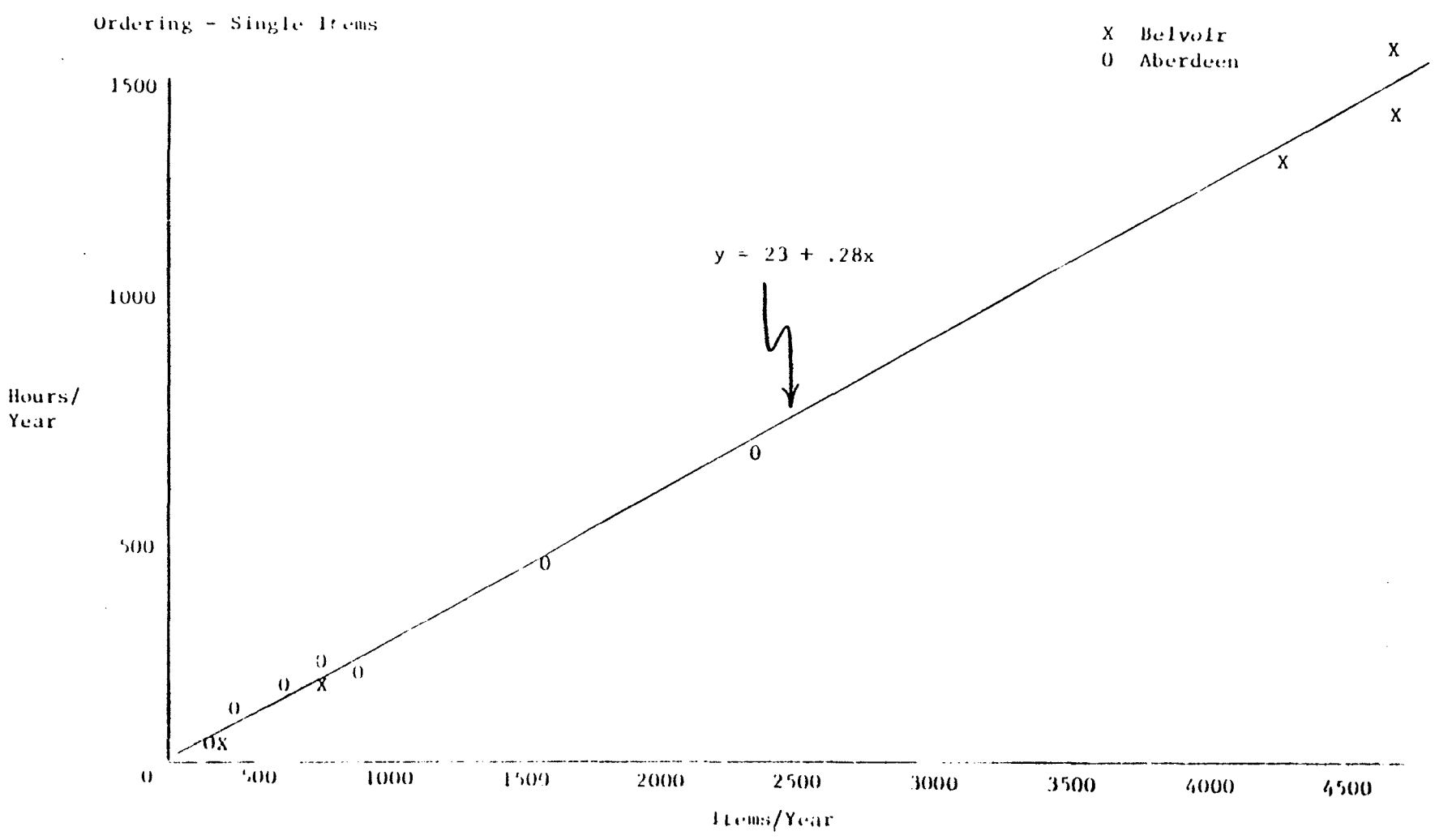


Figure IV-1. The Relationship of Annual Labor Hours and Number of Items Ordered Per year Based on Data from Ft. Belvoir and the Aberdeen Proving Grounds Libraries

include the cost of establishing secure facilities for classified technical report processing, but did include the cost of terminals for dial-up access.

TABLE IV-1. TOTAL FIXED COSTS FOR TECHNICAL PROCESSING ALTERNATIVES FOR 45 LIBRARIES

	Technical Processing Alternatives		
Type of Fixed Cost	Decentralized (45 libraries)	Installation Level (6 installations)	Command Level (1 command)
One-Time	$1,010,101	$980,801	$973,402
Recurring	$ 43,890	$ 32,557	$ 29,593

The one-time set up costs were estimated from the total holdings that needed to be processed (and stored) with each alternative. As we are modeling a set of 45 hypothetical libraries, the cost of computer storage is the same for all three alternatives (see Table D-1 for more detail).

Estimation of the variable costs is considerably more complex. Using the numbers of unit items processed at each activity (e.g., 4200 monographs ordered) at each of the 15 "base" libraries (as displayed in Tables D-2, D-3 and D-4), and combining them with the models set up using the results of the corresponding regression analysis (as displayed in Tables D-5 through D-13), the costs per library, per activity could be calculated under the different configurations. For example, let us consider the current system costs for ordering monographs at Library A. Table D-5 lays out the cost models for the current system, and the first row relates to the ordering activity:

Activity	Cost Component	Unit of Observation	Fixed Cost Calculation	Fixed Cost	Variable Cost Calculation	Variable Cost
Ordering	Labor	Total Items	(93 hrs. x	$1171	(0.22 hrs./	$2.68
	Supplies	Ordered	$12.59/hr.)		item x	
					$12.20/hr.)	$0.05
				$1171		$2.73

(The analysis could easily be formed for the three alternative consolidation arrangements by taking the data from Tables D-6 and D-7, or for ordering serials by taking data from Tables D-8, D-9, D-10, and so on).

From Table D-2 we find that Library A orders 4,200 items per year. The cost calculation is:

current processing costs for ordering monographs at Library A per year = [Total items ordered x Variable cost/item] + fixed cost

= (4,200 x $2.73) + $1171

= $12,637 as displayed in Table D-14.

The annual processing costs for monographs are displayed in Tables D-14 to D-16, for serials in Tables D-17 to D-19 and for technical reports in Tables D-20 to D-22. Finally, the setting up of a technical processing center (TPC) does not reduce the individual library technical processing costs to zero. Costs are incurred by the libraries performing certain of the related activities as described in the previous section. Table D-23 displays the models that were used to estimate these additional library incurred costs, and Tables D-24 to D-25 display the actual cost estimates. The results of the calculations described above are summarized in Table IV-2 below. Technical

reports are not included in this Table becaure they were treated somewhat differently. We costed the current processing activities, and then looked at decentralized processing costs in two situations: one in which no cataloging of reports took place and one in which cataloging was done through DTIC. These costs are displayed in Tables D-20 to D-22.

TABLE IV-2. TOTAL COSTS FOR 45 LIBRARIES

	Current	45 Decentralized	6 Installations	1 Command
Fixed		1,010,101	980,801	973,402
Recurring		43,890	32,557	29,593
Monograph Processing	1,036,215	571,974	527,490	527,490
Serials Processing	275,553*	136,230	54,693	54,693
Costs incurred by libraries				
a) Monographs			13,998	13,998
b) Serials			87,783	87,783
Total	$1,311,768	$762,195	$697,322	$686,959

*Includes fixed costs.

As a result of these cost estimates and based on the interactions between members of the Project Team and the SAG and Working Committees, we recommended

that the Army set up TPCs at the installation level. (Actually we refined this recommendation into a series of related recommendations, see Section V, to consider such systems as TRALINET, the COE network, single library installations, etc.). Our results indicate that considerable savings will be derived if our recommendation is applied Army-wide. If the set up costs are spread over a period of 5 years, then the 5-year savings for the 45 libraries is approximately $2 million, and approximately $22 million Army-wide. These projects were based on volume projections derived from the 1976 study, and from Ft. Belvoir statistics and growth rates (see Tables D-26 to D-29).

In estimating costs for establishing TPCs at Ft. Belvoir and Aberdeen Proving Ground equipment needs should be considered. BRL at APG has requested a minicomputer to support the ILS. If disk storage were adequate, this minicomputer could serve the installation. In addition, terminals are available in thirteen of the fifteen libraries studied.

V. RECOMMENDATIONS

Problems previously identified in the 1976 study, frequently mentioned during the course of this study include:

1. difficulties associated with procurement of library materials
2. staff shortages
3. lack of channels and support for interlibrary communication
4. inadequate space
5. inadequate budget
6. lack of interest in library problems at the local level.

The basic purpose of the contract "Integration of New Technology in Army Libraries" was to examine the feasibility of establishing an installation-level technical processing center, and to plan for its implementation. In so doing, some of the above mentioned problems could be alleviated.

The recommendations fall into three categories: "Major Recommendations," including a discussion of establishing the Technical Processing Center, "Additional Recommendations," and "Auxiliary Recommendations."

Major Recommendations

- Establish an installation-level Technical Processing Center (TPC)

- Acquire an integrated, minicomputer-based turnkey library automation system for each installation as part of the TPC. Select the vendor by issuing an RFP.

- Retain TRALINET.

- Retain Corps of Engineers bibliographic network.
- Establish a DA level office for the purchase of serials and other common library materials.
- In the future, look at most effective network possibilities for installations with a single library.

INSTALLATION-LEVEL TECHNICAL PROCESSING CENTER

One technical processing facility on each installation should be established. Its mission will be to support technical processing activities for all libraries on that installation. Technical support functions to be performed include:

- monograph acquisition and cataloging
- serials acquisition and control
- creation and maintenance of the online catalog
- production of a union serial holdings list
- funds accounting
- production of management reports

Equipment

Install a central minicomputer for the installation. The exact equipment will be determined by the system. Terminals need to be installed in each library that does not already have one to allow access to the minicomputer, to provide for public access to the catalog, and to provide access to commercially available online data bases.

Personnel

A Technical Processing Center on an installation the size of Ft. Belvoir or Aberdeen Proving Ground would require at least five positions. The positions would include librarians, technicians, and clerical support for acquisitions and cataloging. Staffing requirements were based on the number of full-time equivalent (FTE) positions at Ft. Belvoir and APG currently devoted to technical processing (nine at Ft. Belvoir and eight at APG), projected time savings by introducing automation (see Appendix D, Tables D-7, D-10, and D-13), and factoring in for economies of scale.

The Technical Processing Center is designed to provide administrative, professional and clerical support to participating libraries. Professional Library services to clients will continue to be a function of professional librarians (GS 1410).

There are three areas of library services for which clear definition of duties and responsibilities are essential:

1) Acquisition. The professional (GS 1410) librarians in the libraries must be responsible for selecting items to be procured and for directing their procurement by the Technical Processing Center (TPC). While pre-order searching may be complex, it is accomplished with the advice of the librarian and would be performed by a GS 1411, Library Technician.
2) Cataloging also will range from simple to quite complex but will be covered by guidance and accomplished as directed by professional librarians in the individual libraries. Catalogers will need input from the librarians on the unique subject assignment requirements at each library.
3) Systems operation and use of ADP have two aspects, the daily operation of systems in effect, and the design and development of new or improved systems, particularly those which add functions to provide better library service. Daily operation of current systems requires the highest level of knowledge and skill in library operations and TPC functions. Design and development of systems properly is the responsibility of professional library personnel who are also informed/skilled in computer systems design.

This combination of knowledges and skills is relatively rare, the time and effort involved in development are extensive, and results usually are applicable to a wide range of library situations. For these and many related

reasons, major systems design should continue to be reviewed at the ALMO level where resources will be most effective for the Department of the Army.

Systems operations personnel in the TPC would be encouraged and expected to design and recommend improvements in existing programs and undoubtedly would provide useful ideas for systems expansion. The latter, however, should not be a requirement for nor considered a function of TPC operation.

In accordance with the above the following structure is recommended for an installation Technical Processing Center for posts of the size and scope of Fort Belvoir or Aberdeen Proving Ground:

TPC Staffing

Each installation needs to create the new position of systems librarian, who would have at a minimum, the following duties:

Systems Librarian
GS1410-11/12

Working under the supervision of the chief librarian of the host activity's library, the incumbent:

- is responsible for controlling all activities related to the creation and maintenance of the TPC's minicomputer-based turnkey system
- is responsible for the coordination of ordering, receipt and processing activities in the TPC

- schedules distribution of work to ensure an even flow, expedites handling of priority items, revises work schedules or procedures and does acquisitions and cataloging work as necessary to meet changes in workload requirements
- assists in the design, testing, implementation, and evaluation of automated procedures related to the TPC
- corresponds with vendors and other professionals to keep abreast of new developments
- designs and prepares statistical reports, lists and bibliographic tools based on requests received from library management, staff, and other users
- directly supervises TPC personnel

This position requires experience in the maintenance of automated bibliographic files. The position also requires a thorough knowledge of library theory and technical processing activities.

Reassignment of Personnel

No personnel should be reassigned to the TPC from libraries that are staffed by three or fewer positions. Each library on each installation should contribute personnel to staff the TPC. For those libraries not contributing personnel, funds could be contributed to pay for the positions. Based on volume of activity, the project team determined that the following libraries could contribute the stated number of positions:

Library	Number of Positions
Van Noy	3
CERC	1
MERADCOM	2
BRL	3
CSL	1
Wood	1
APG Post	1

The positions to be filled, not including the new position of systems librarian, are: Cataloger (two at each TPC), Assistant Cataloger (one at each TPC), Acquisitions Assistant (two at each TPC), and Clerk (one at each TPC).

Supervision

The TPC would be attached to and under the direct technical and administrative supervision of the chief librarian of the host library for the TPC (or a designated professional subordinate, where the library's scope is such that branches are or can be established). All other serviced librarians would provide technical supervision over operations accomplished for them by the TPC, either directly, through the steering committee, or through the designated supervisor, as determined through local agreement.

The chief librarian of the host library for the TPC:

- evaluates the TPC with regard to filling user needs, adequacy and efficiency of equipment, methods of operation and personnel;
- coordinates overall implementation of the TPC, including staffing and policy guidance;
- provides management and operational direction of the TPC.

Librarian GS 1410/11

Cataloger

Working with a minimum of guidance and supervision from the TPC's systems librarian and from installation librarians, the incumbent:

- performs descriptive and subject cataloging of all types of materials
- classifies literature
- uses OCLC, AACR2, various subject heading lists, national bibliographies, and reference books ir scientific fields
- identifies cataloging additions and changes required for previously cataloged materials
- reviews materials processed by assistant catalogers
- assists in reviewing existing cataloging policies and practices; exercises judgment in recommending changes or additions

This position requires a master's degree in Library Science and experience with an automated cataloging system.

Assistant Cataloger

Library Technician

GS 1411-5/6

Working under the supervision of the TPC's Cataloger, the incumbent:

- performs pre-cataloging searching in online and manual catalogs, and OCLC
- performs temporary or preliminary cataloging
- catalogs new editions and new volumes of works already in the collection

- performs cuttering, as required
- enters new data into online files
- initiates system production of labels for physical processing

Acquisitions Assistant

Library Technician

GS 1411-06

Working under the supervision of the designated head of the TPC, the incumbent:

- prepares and inputs online complete bibliographic information and order data for purchasing library materials
- maintains liaison with the purchasing office
- receives and checks in new materials, updating online record each order
- processes invoices/packing slips, as required
- maintains binding records online

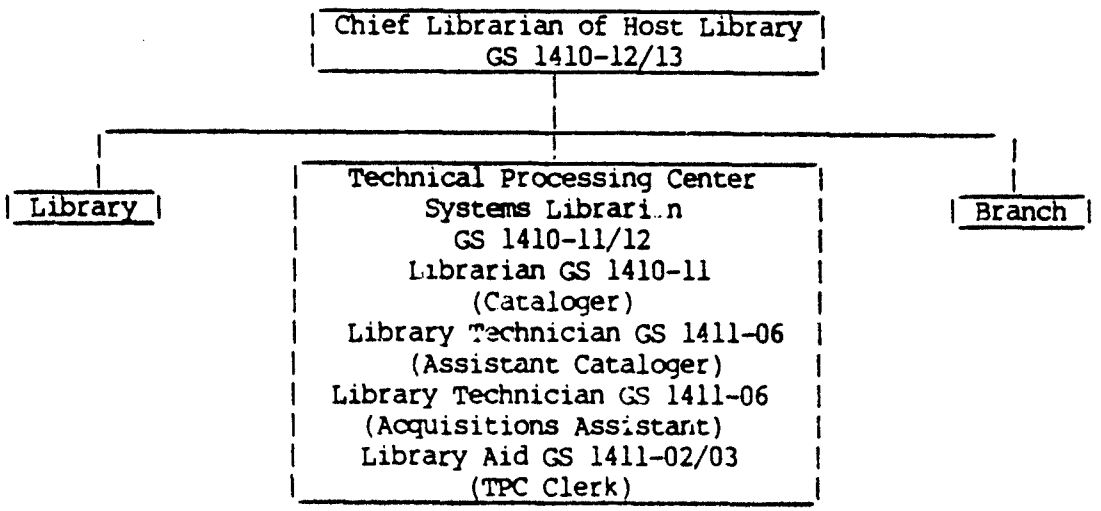
Clerk or junior technician

Library Aid, GS 1411 02 or 03

Working under the supervision of the designated head of the TPC, the incumbent:

- performs physical processing of library materials
- serves as messenger between TPC and installation libraries
- mails items including system-generated claim notices

Proposed Organization



TRAINING

It will be necessary to conduct three levels of training before an automated integrated system becomes fully operational:

1) in-depth training of TPC personnel
2) training of individual library staff
3) training for the public

At a minimum, every staff member of the libraries, as well as the TPC, should have completed an introductory course in Automatic Data Processing. This could be a basic ADP course conducted by the US Department of Agriculture Graduate School, a local college, or it could be a course developed at the local installations for users of the ADP facility. All library staff must become confident in the use of terminals, and aware of the capabilities and limitations of the TPC's minicomputer.

Care should be taken to ensure that at least two staff members in the TPC become proficient in the operation of each functional aspect of the system; the systems specialist should be one of those people.

In general, the vendor providing the automated system should be expected to provide graining to TPC and library staff. The vendor may also provide training aids to assist the public in the use of the online catalog.

Prior to each module (acquisitions, online catalog, serials control, circulation) becoming operational, the vendor should provide training

appropriate to the level of need. Everyone will need an overview of the system, but only TPC personnel need to know every detail of the acquisitions module.

The vendor can provide training by conducting training sessions at the installation for everyone involved, holding training sessions at the vendor's site for staff members, or by providing training materials so that the Army can conduct its own training sessions. Some vendors have excellent training materials for self-instruction. Any arrangement can be specified by the Army in the RFP.

Products of the pilot project TPCs could include guidelines and procedures for the operation of a TPC, so that as other installations establish TPCs, pilot project personnel could be used to train new TPC personnel.

Library and TPC Responsibilities

The flowcharts on the following pages, visually document the library and Technical Processing Center activities.

Individual libraries -

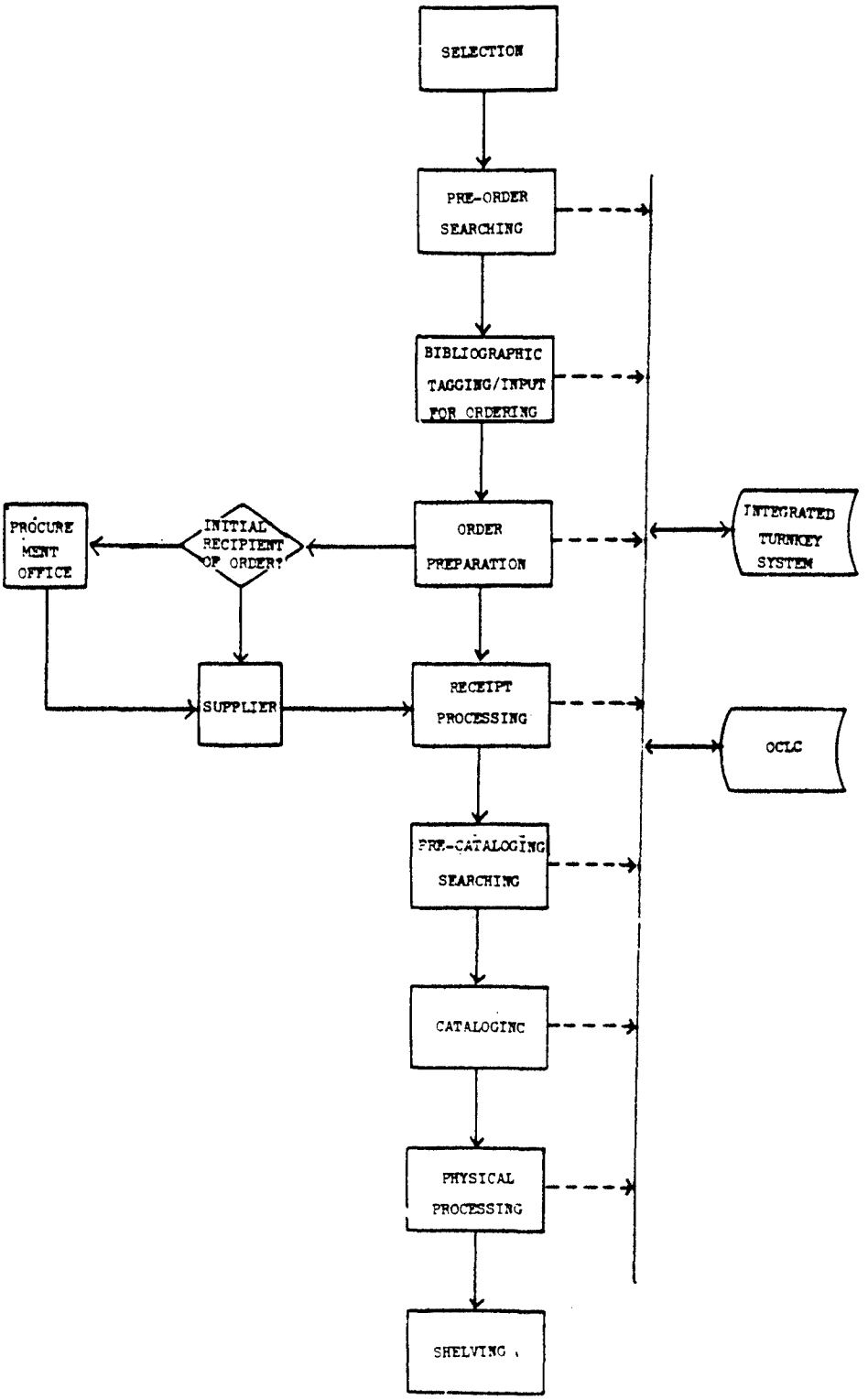
- participate with the technical processing center to ensure the cost effective application of resources
- select all materials that are to be ordered by the technical processing center
- retain property ownership

The Technical Processing Center (TPC) -

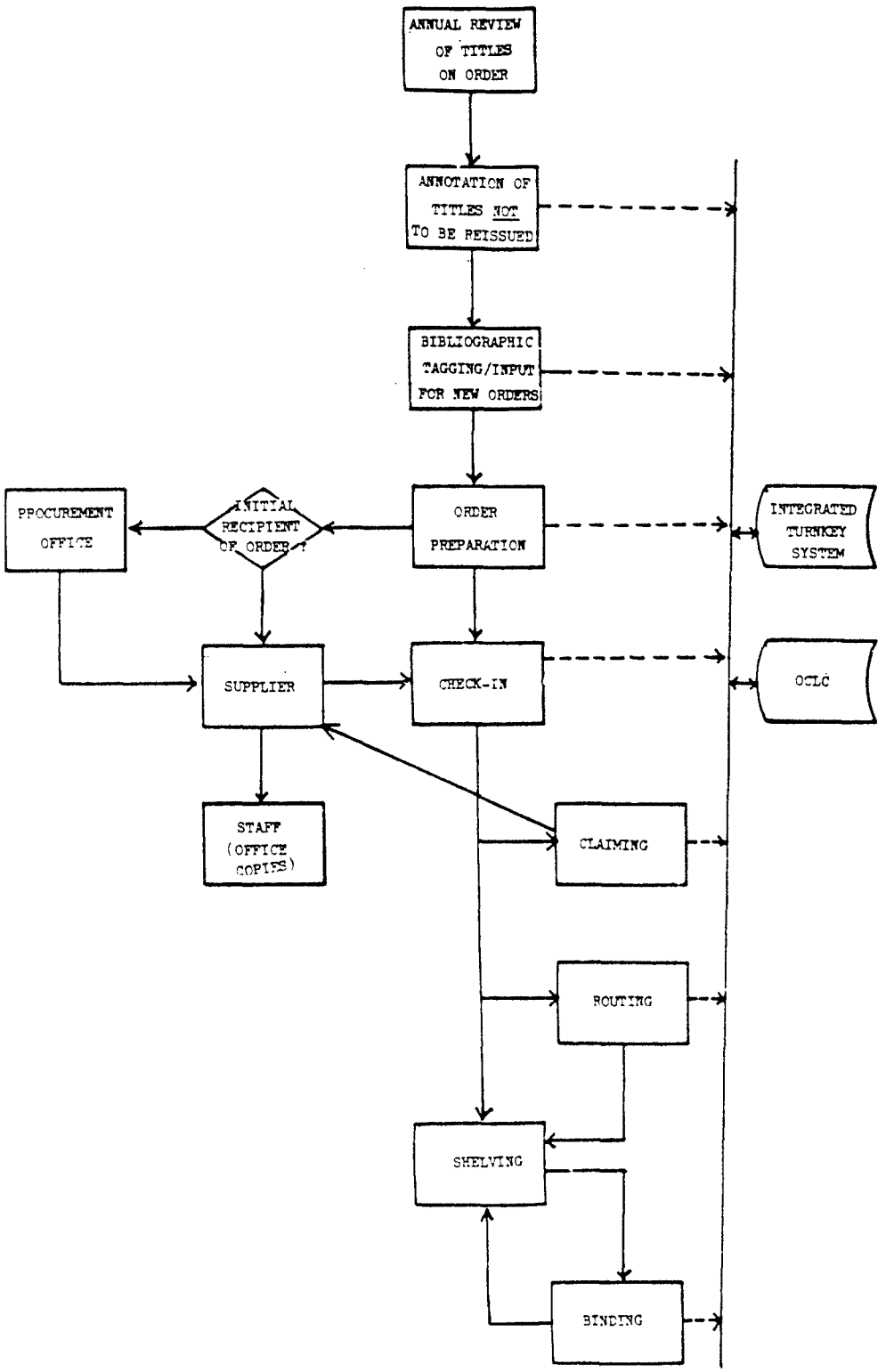
- places orders for monographs and serials for all libraries on the installation
- receives and catalogs monographs
- maintains the installation's online catalog and union lists
- prepares statistical library management reports

Individual libraries retain several functions completely.

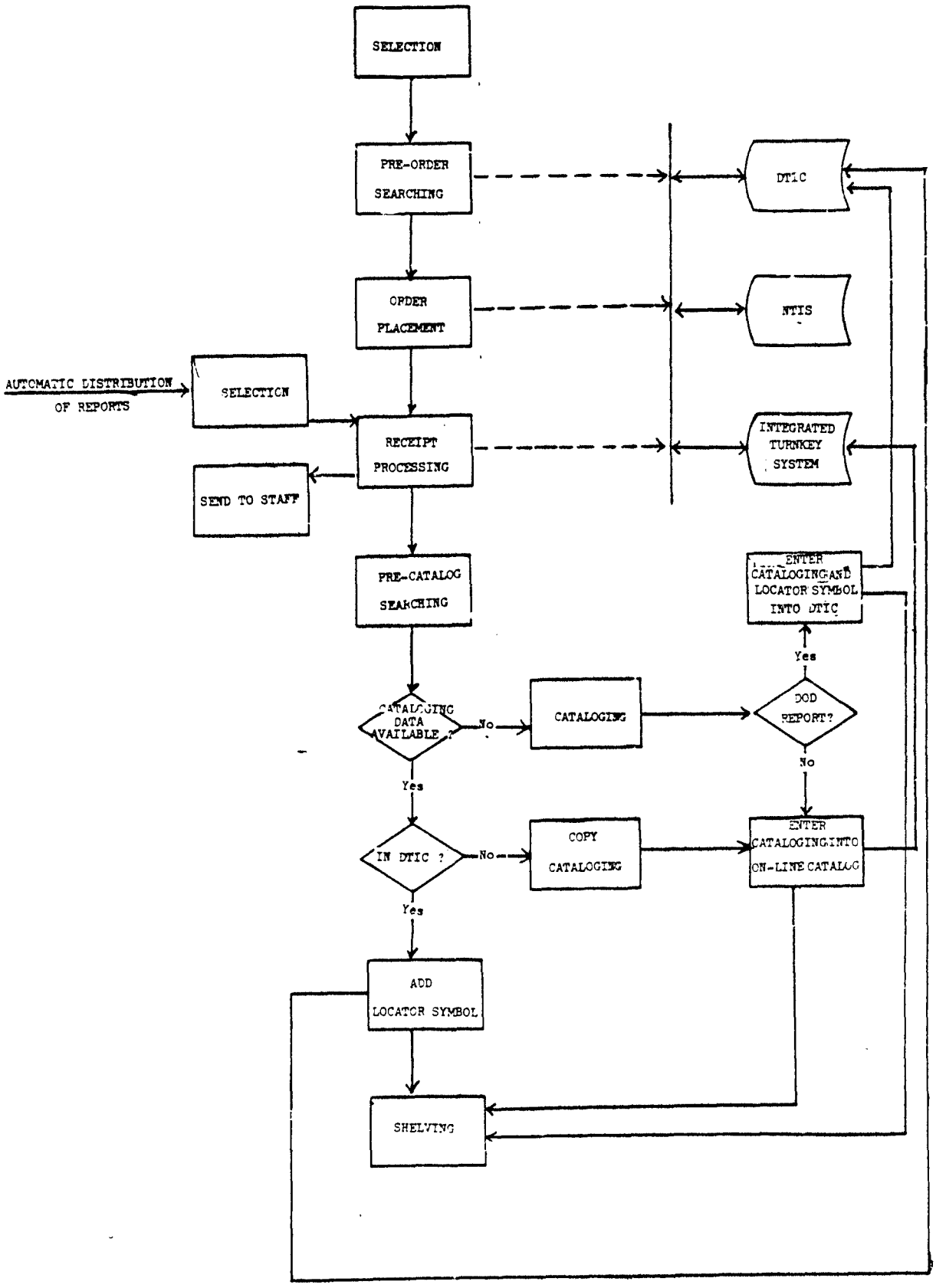
- Monographs - selection, pre-order searching, supply bibliographic citations to TPC
- Serials - selection, pre-order searching, serials check-in, routing
- Technical reports - all functions as appropriate



MONOGRAPH PROCESSING



SERIALS PROCESSING



TECHNICAL REPORT PROCESSING

FUNCTIONS TO BE PERFORMED BY TPC

MONOGRAPHS

ORDERING

RECEIVING

CATALOGUING

VENDOR INFO. & PRICE

PHYSICAL PROCESSING & SUPPORT DOCUMENTS

SERIALS

ORDERING

CLAIMING

BINDING SLIPS

OTHER ACTIVITIES

MAINTAIN ONLINE CATALOG

PRODUCE UNION LIST OF SERIALS

FUNDS ACCOUNTING

MANAGEMENT REPORTS

FUTURE EXPANSIONS

CIRCULATION CONTROL

ARMY LIBRARY NETWORKING

FUNCTIONS TO BE PERFORMED BY

THE LIBRARIES

MONOGRAPHS

SELECTION

PRE-ORDER SEARCHING

PREPARATION OF BIBLIOGRAPHIC CITATIONS

ORDERING (VIA TPC)

SHELVING

SERIALS

SELECTION

PRE-ORDER SEARCHING

PREPARATION OF BIBLIOGRAPHIC CITATIONS

ORDERING (VIA TPC)

CHECK-IN

ROUTING

SHELVING

OTHER ACTIVITIES

INTERLIBRARY LOAN

Library requests can be forwarded to the TPC in several ways:

- online
- verbally, then confirmed online or in writing
- in writing

Online access to the TPC's minicomputer requires that each library have a terminal connected to the TPC's minicomputer. Through its electronic mail service, requests are keyed in directly to the TPC. This information is then transfered to the acquisitions module by TPC personnel.

A time priority of requests should be designated.

Emergency - The request is telephoned or hand delivered to the TPC. Order will be confirmed later in writing. Item is cataloged and processed at a later date. This category should be used with great discretion. Order is initiated and delivered to the requestor within 24 hours of request.

Rush - Request is telephoned or hand delivered to TPC. Acquisition is done on an expedited basis, processing may be minimal. Order is initiated the same day as request, and as is completed within 5 working days of request.

Routine - Normal priority; acquisition, cataloging and processing is complete. Procurement is initiated within 3 working days of request and processing is complete within 30 working days.

Difficult - Complex acquisition due to high verification requirements because item is foreign or is available from an obscure source. Order is initiated within 5 working days and a written progress report is sent to the requestor every 30 days until the processing is complete.

The library has performed pre-order searching to check its own files to see if the item is already available. Pre-order searching could also be performed in a bibliographic utility such as OCLC to determine by review of subject headings whether or not this title would really be appropriate for the library's collection. Because the library is searching an on-line catalog that also contains holdings for other libraries on the installation, it may be that the tile is found in another library's collection. The decision could then be made to either go ahead with the order, or to borrow it from another installation library.

The TPC will

continuously throughout the day:

- place orders
- process received orders
- catalog
- physically prepare items

once a day:

- do on-line catalog maintenance
- check-in journal issues
- follow up on claims, emergency and rush orders
- deliver items to libraries

once a week:

- prepare statistical library management reports

The statistical summaries will delineate each library's number of titles ordered and cataloged and funds encumbered.

Location

The post commander of each installation should determine the best location for the Technical Processing Center. In many cases, it should be placed under the supervision of the largest library on the installation. Automation may already be present, the staff would be somewhat trained and less likely to experience major disruption. In addition, the post commander or the selected activity commander shall take responsibility for auxilliary services to the TPC such as maintenance of the facility, utilities, etc.

Space

Space in the TPC for staff should be planned in the amount of 120 square feet per person. In addition the TPC requires space for equipment, to be determined by the vendor. A door suitable for receiving books, and some storage space including shelving for library materials must be available.

Funding

Support agreements should be set up between each post commander or activity commander over the activity supporting a library on an installation and the Technical Processing Center to provide financial support to the TPC. Charges could be based on number of items the TPC processes for each library, or number of hours the TPC spends processing items for each library. Billing could be monthly, quarterly, or annually, or each library could establish a deposit account.

Acquiring an Automated Library System

Move toward acquiring a fully integrated minicomputer-based library automated system by selecting a vendor who will provide a tailored system for the Army.

The following steps should be taken to ensure the selection of the most appropriate system or service for the library:

- Write a 'Request for Proposal' (RFP)
- Evaluate proposals
- Award contract
- Test and accept system.

Writing the RFP

The Request for Proposal (RFP) describes all the features and services the library requires of the system to be implemented. Each feature and service should be designated as mandatory, desirable, or optional. In the majority of applications, it is vital for the library to produce a formal, written RFP, the primary purpose of which is to obtain formal, written proposals from several potential vendors. The RFP can be based on the feasibility analyses and design phase. If necessary, some of the planning documentation can be added for background information so that the vendors can determine how the system they are proposing will fit into a long-term plan. Contractor assistance is often required in the preparation of RFP's and the evaluation of ensuing proposals. See Appendix G for an outline of points that could be included in on RFP for an integrated automated library system.

Evaluate Proposals

The vendors who respond to the RFP will describe their systems in as flattering a light as possible. They often include, as part of their proposal, a certain amount of sales literature - the "glossies" - which describes the products in extremely general terms. These materials all too often outline system enhancements or new features which are not actually available at the time. One way to determine the current status of any system is to arrange for a demonstration of the system. If the vendor has the system installed in a library elsewhere, then it would be advantageous to arrange the demonstration at that site. However, even if this is not possible, it is important to talk to those who are working with the system. Users are considerably more inclined to admit problems with the system than vendors, especially if the users are actually in direct contact with the system.

The vendors' proposals should be reviewed and evaluated against a predetermined set of prioritized evaluation criteria (usually based on the feasibility analyses and design), then a single vendor should be selected.

Testing and Accepting the System

The acceptance criteria for the system should already have been outlined in the RFP. Once a vendor has been selected, then an acceptance test should be performed (by, and at the expense of, the vendor). The test should, as closely as possible, simulate the activity to which the system will be subjected in the library. In particular, care should be taken to ensure that

the response time of the system is adequate with the expected load of users and the expected mix of transactions (e.g., in an on-line circulation system that the response time not drop below 30 seconds for check-in or check-out at peak activity times). The insistence on testing can help the library. It can require that the vendor upgrade or enhance the system or else be disqualified. If, however, no testing is required and the system, once installed, fails to perform adequately, then it is the library that must bear the cost of the upgrade.

Additional Recommendations

- Phased incorporation of new technology.

  The implementation of TPCs should begin with a two year pilot project at Ft. Belvoir and Aberdeen Proving Ground.

- Advantages to a phased approach to implementation are:

  ability to integrate new technologies as they become available.

  ability to react to unforeseen changes in the internal or external operating environment

  time for repeated evaluation and feedback regarding the performance of the developing system in light of specified requirements and operating parameters

  time for operating personnel to familiarize themselves with new technologies in a gradual step-by-step manner.

- Cease card production.

  Each year, approximately 316,000 cards are produced and filed under the current system at Ft. Belvoir and APG. The average cost of filing each card is $.20. The online catalog obviates the need for card production.

- Use a bibliographic utility for cataloging.

  Do as little original cataloging as possible. Technical Libraries with a low hit rate on OCLC, should use RLIN on a test basis to determine if that bibliographic utility can provide acceptable cataloging data for titles not cataloged in OCLC.

- Convert all catalogs into machine-readable format and enter all records into the installation's online catalog.

- Produce an installation union list of serial holdings using OCLC's Union List service. This service has the flexibility that affords the best opportunity for the Army to create an Army-wide union list of serials. The ALMO and the local Steering Committees should explore possible sources of funding for production of the installation serials holding lists.

- The ALMO should work with OCLC thru FEDLINK on the development of special library locator symbols, including the group designator, for Army libraries to allow for future manipulation of records containing Army locator symbols, so that data may be sorted by commands, by region, by installation, by type of library, or any other grouping. The ALMO should consider negotiating for the use of existing standard installation codes developed by the Army.

- Utilize existing cataloging whenever possible for technical reports. Libraries with technical report collections should have access to DTIC, and should use it as an online catalog, where feasible. DTIC allows searching by a number of elements including corporate author, title, personal author, report number, subjects, and contract numbers. For reports which are not in DTIC, NTIS and other commercially-available data bases should be searched to capture bibliographic information before doing original cataloging. If a library must perform original cataloging of technical reports, the reports should be treated as monographs and entered into OCLC, and the data transfered to the installation's online catalog.

- The ALMO should work with the Deputy Chief of Staff for Research Development and Acquisition (SARDA) in the effort to obtain DA acceptance of computer-produced facsimiles of government procurement forms. Such customized output should become one of the technical requirements included in the RFP for a minicomputer-based integrated library automation system.

- Libraries at the pilot project sites should provide additional services to users through production of specialized output from the minicomputer system. The following products are examples of such output:

  - weekly subject accession lists printed and distributed according to users' subject interest profiles.
  - weekly accession lists of all new titles sorted by subject and posted in the library.
  - annual list of serial titles held by the library, with new serial titles repeated in a separate section of the list.
  - listings of library holdings in specific subject areas.
  - lists of agency, or agency-sponsored publications which are held in the library.
  - customized bibliographies with parameters based on user's information needs.
  - monthly reminder list of books checked out to each user; users may be encouraged to return items which they do not use regularly so that they may be made available to other library patrons.
  - annual list of titles routed to each staff person; the list should be annotated and returned to the library, so that the routing lists may be updated.

The items mentioned above may be produced as printed products or may be made available online to staff members who have terminals in their offices/ laboratories. Use of simple commands should be able to produce the desired information.

- Libraries should provide more reference service to library patrons. Staff time freed from technical processing should be spent in reference.
- Terminals should be installed in the libraries to allow library patrons to have access to the online catalog.
- Libraries could provide variations of electronic mail service and/or word processing services through the installation's minicomputer.

AUXILIARY RECOMMENDATIONS

- Each library should make a copy machine available for patron use and to facilitate responding to inter-library loan requests.

- Establish a purchasing office for library materials under the auspices of the Army Library Management Office. This office should undertake to establish open-ended contracts for library procurements as discussed in Chapter II.

- The ALMO should continue its development of a standardized annual report form for use by all Army libraries.

Statistical analysis is an important tool in the management of any organization. In a library environment, statistics can be used in a variety of ways; for example, to justify budget and staffing levels, to guide collection development, to plan training, and to plan equipment upgrading. It is to the benefit of librarians to periodically evaluate their own library operations by using statistics.

The ALMO was established in March 1980 to provide a central office for the management of library resources, and to develop cooperative programs to improve levels of service to library users and to be cost effective. If the ALMO is expected to evaluate and suggest improvements for the total Army library program, it must be able to substantiate its suggestions with facts--facts that can only be derived from reports from the field.

The ALMO should develop definitions of terms and include them with the annual report form to ensure consistency in reporting. Existing command-level reporting forms should be reviewed as part of the development of the DA form; when the new form is officially adopted, use of that one form should be implemented Army-wide. The command library headquarters and other major Army library activities should submit a compilation of their statistics to the ALMO on an annual basis, using the new DA form.

Many of the statistics to be reported annually to DA level should be generated as a product of the local minicomputer-based integrated library system; therefore, these specific statistical requirements for annual reporting should be included in the technical requirements of the RFP.

- Establish a central translation information center.

The ALMO-level library purchase office can work with ALC and/or command librarians and designate a library, such as the Foreign Science and Technology Center in Charlottesville, to act as a clearinghouse for translations of journal articles, books, patents, etc. Technical libraries are frequently called upon to provide translations of information available only in foreign

publications. Some libraries maintain translating contracts so that items are ordered from one source. Most libraries do not have such contracts. Although requests are infrequent, to obtain a translation is a costly and time-consuming activity.

The Translation Information Center (TIC) would handle the negotiation of open-ended translation contracts available to any library that wishes to participate. The TIC would maintain data on citations of translated materials available in Army libraries, so would serve as a translation clearinghouse.

The library needing a translation would contact the Translation Information Center to determine availability of the translation. The TIC would search its own data base, then published indexes that list available translations, such as Translations Register-Index, Transdex Index, or World Transindex. The TIC would notify the library of the item's availability and source, or non-availability. The library would then order the translation from another Army library, through inter-library loan, or through the library's contract with a translation service. When the translation is received, the library would notify the TIC of its availability. That information would be recorded on TIC's translation data base.

- Discourage libraries from purchasing desk and office collections, including periodical subscriptions, except where essential to the performance of the mission of the library.

The library is the central repository for documents that support the mission and function of the organization it serves. Library staff time should be spent in the overall pursuit of the organization's goals. Purchasing items

that will not be shared by all library patrons is counterproductive. Often these items are considered library property, are therefore vouchered, and often cataloged, yet they are not made available to the general library population. Staff time has been diverted from providing service to the overall library.

- Offices should not establish "unofficial" library collections (collections not supported by library accounts). Unofficial libraries should not be allowed to use official installation library resources to develop and maintain small collections.

Some offices develop collections, rather than using official library collections on the installation. These collections often duplicate material already available in the libraries. The project team observed that the unofficial libraries at Ft. Belvoir relied on the larger libraries for administrative support in collection development and organization, including cataloging. These small collections are staffed by non-librarians. Work previously performed by the installation libraries for them is often not well-maintained, and assistance of installation librarians is requested again. One official library at Ft. Belvoir has had repeated requests from the same office to perform work whenever personnel changes.

An alternative to the current operation of these unofficial libraries is to transfer their collections to the appropriate official library on the installation and to direct users to the appropriate source.

VI. IMPLEMENTATION PLAN

The following implementation plan assumes Army acceptance of the recommendations presented in this report.

Implementation

The steps in the implementation plan which refer to the TPC may be summarized as follows:

Year 1 - planning and coordination

Year 2 - contract advertisement and award; equipment installation

Year 3 - start-up operation of TPC

Year 4 - evaluation of year 1 of operation of TPC

Year 5 - evaluation of year 2 of operation of TPC

Year 1:

1) The ALMO should brief the Army Library Committee (ALC) on the proposed plan to establish installation-based technical processing centers (TPCs) at APG and Ft. Belvoir as a two-year pilot project for the consolidation of technical processing activities for all libraries on the two installations.

2) The ALMO should coordinate the final report with MACOMS/agencies at the two pilot project sites. The post commanders should be briefed on the proposed plan for local consolidation of technical processing functions. The post commanders should recommend and obtain concurrence on the installation libraries that will lead the pilot projects.

3) a) Funds should be earmarked at DA or installation level for the acquisition of a minicomputer-based integrated turnkey library system and for site preparation at each of the TPCs. The initial investment may be amortized over a 5-year period, with each designated organizational user of the system charged for the recovery of costs based on level of service received.

b) Funds should be designated so that terminals for the TPCs and for the individual libraries can be purchased as a group in order to obtain a better price. The cost for acquiring terminals for the TPCs should be amortized as indicated in the preceding paragraph, while the cost for acquiring terminals for the individual libraries should be charged to each activity.

c) Operating and manpower costs for the TPC should be charged to the designated participants based on level of service received.

d) The designated participants in the TPC should transfer technical processing manpower and related funding to the activity hosting the TPC.

e) The ALMO should

1) monitor the pilot project; reporting requirements should be specified;

2) continue with the development of an Army-wide plan for a coordinated approach to the automation of library activities and library support services;

3) assign its ADP librarian to work with the Steering Committees in coordinating the pilot project.

f) The command librarians of those commands/activities that are designated to participate in the pilot project should

1) participate by providing input to the on-going evaluation of the pilot project;

2) work with the ALMO in arriving at any joint recommendations related to the pilot project, both during its operation and following completion of the test period.

4) Following approval of the pilot project, the appropriate agencies should develop local implementation plans.

5) The present Working Committee at each installation should be established as a Steering Committee with the chief librarian of the host activity responsible for the TPC serving as coordinator of the Committee.

6) Local librarians should begin weeding their collections and pulling cards for weeded items, so that retrospective file conversion, if undertaken, would not include unnecessary input of records.

7) The ALMO should assist the chief librarian of the host activity TPC in preparation of the statement of work and technical requirements for the RFP. This would be issued to obtain the hardware, software, maintenance, training support and site preparation, such as: air conditioning, electrical service, telephone serivce, etc. for the minicomputer-based pilot project. Specific factors for evaluation of responses should be developed also.

8) The ALMO ADP librarian should continue to work with the appropriate DA automation support/coordination activity on technical questions and DA regulations concerning the acquisition and maintenance support of hardware and software and the development of networks within DA.

9) Libraries of APG and Ft. Belvoir should prepare an up-to-date inventory listing of serials holdings for input into OCLC. Data entry could be performed by a single library on an installation, or by a contractor using its own OCLC terminal.

10) Libraries at APG and Ft. Belvoir with technical report collections should investigate participation in DTIC's SBIN program. Training in cataloging to meet DTIC's requirements will be necessary.

11) The ALMO, together with the ALC and/or command librarians should designate an appropriate Army library to serve as the Army's central translation information center (TIC).

12) ALMO should study the cost-benefit analyses done by DAAG-MSL on centralized procurement of monographs that were prepared in previous fiscal years. The large discounts on purchase price and the savings in administrative time at the local level have resulted in considerable savings to the Army.

13) The ALMO should begin a pilot project to determine the feasibility of centralized negotiation of contracts for serials procurement Army-wide.

Year 2:

1) The draft statement of work and technical specifications for the RFP to obtain a minicomputer-based integrated turnkey system to support technical processing at the pilot project sites should be reviewed by the affected command librarians and by the Steering Committees. A Technical Evaluation Panel should be established to participate in the evaluation of proposals, based on the technical requirements and statement of work. The Army may be advised to release the technical specifications for industry review and comment prior to formal release of the RFP.

   Terminals for the TPC's and the individual libraries should be listed as an optional requirement in the RFP, so that the Army may retain the option of obtaining them from another source if more advantageous.

2) The RFP should be advertised, responses evaluated, and visits made to operational sites of the systems of all vendors within competitive range.

3) A vendor should be selected and the contract awarded.

4) Begin site preparation at both installations.

5) Orders should be completed at the project sites for transfer of personnel and funds for operation of the TPCs.

6) A system librarian should be hired for each TPC.

Year 2:

1) The draft statement of work and technical specifications for the RFP to obtain a minicomputer-based integrated turnkey system to support technical processing at the pilot project sites should be reviewed by the affected command librarians and by the Steering Committees. A Technical Evaluation Panel should be established to review the technical requirements and statement of work and to participate in the evaluation of the proposals. The Army may be advised to release the technical specifications for industry review and comment prior to formal release of the RFP.

   Terminals for the TPC's and the individual libraries should be listed as an optional requirement in the RFP, so that the Army may retain the option of obtaining them from another source if more advantageous.

2) The RFP should be advertised, responses evaluated, and visits made to operational sites of the systems of all vendors within competitive range.

3) A vendor should be selected and the contract awarded.

4) Begin site preparation at both installations.

5) Orders should be completed at the project sites for transfer of personnel and funds for operation of the TPCs.

6) A systems librarian should be hired for each TPC.

7) If requested, the ALMO ADP librarian, together with the Steering Committees, should determine to what extent retrospective conversion of the shelflists of libraries at both pilot sites is desirable. Specifications for a Statement of Work for recommended conversion should be prepared.

8) Data entry training should be provided for library staff who will need this skill to use an on-line system more efficiently.

9) The vendor should install equipment and software and complete the initial testing of the system. The initial equipment configuration should include installation of one terminal at each library, so that all libraries on an installation may have access to the TPC on Day 1 of operation.

10) Personnel and property should be transferred to the TPCs.

11) The vendor should provide in-depth training to the TPC staff in all aspects of the system which relate to acquisitions and cataloging. The TPC staff should input all outstanding orders into the system during the training period.

12) The vendor should provide training to the appropriate staff at the local libraries to provide an overview of system functions and to support on-line searching of the on-line catalog and inputting of bibliographic information for acquisitions.

13) Two copies of the shelflist of each installation library should be made--one for the local TPC and one for input of retrospective records if conversion is indicated.

14) The TPC should become operational with the functions of acquisitions (of monographs and serials). The funds accounting portion of the acquisitions module should be available for use on Day 1 of operation. When the first acceptance testing is completed and the online catalog is accepted, the card catalogs at the local libraries should be closed. The Army should conduct acceptance testing of the system during the first 30 days of operation of each TPC.

15) Procedures should be developed and implemented for annual update of changes to the serials holding data in OCLC by TPC staff.

Year 3:

1) The vendor should provide in-depth training in the operation of the full serials control module to the local systems librarian and to the appropriate staff at the pilot libraries. An overview of the functions and capabilities of the full serials control module should be presented to the TPC staff.

2) Full serials control (check-in, routing, claiming, and binding control) using the minicomputer-based integrated system should be phased into operation.

3) A cost-benefit analysis of the COE and TRADOC library network projects should begin and should continue for a two-year period concurrent with the operation of the TPCs. Development and set-up costs should be documented, if not available already. The purpose of these cost-benefit analyses is to document and compare the projects using current costs.

Year 4:

1) The cost and degree of success of the pilot TPC's should be evaluated at the close of Year 1 of operation.

2) The cost savings to the Army resulting from use of a single negotiated contract for the procurement of serials for Army libraries should be documented, including both the discounts provided for purchasing multiple copies and the savings in administrative time.

3) The ALMO should examine acquisitions data from the pilot installations to determine the degree of commonality in the acquisition of monographic trade publications. This data could serve as a basis for recommending that centralized contracts be negotiated for procuring certain publisher's works or selected classes of reference materials.

4) The senior supervisory librarian responsible for the TPC should use system-generated reports to examine the performance of the various book dealers and the serials vendor. The performance evaluation should be presented to the Steering Committee for review.

Year 5:

1) The ALMO, together with the command librarians and the local Steering Committees, should evaluate the degree of success and costs of operation of the pilot TPCs at the end of Year 2 of operation.

2) The ALMO, the command librarians, and the Steering Committees should determine if it should be recommended that the pilot TPC be continued as an on-going library support service at each of the two installations.

3) The cost analysis of the TPCs should be compared with the cost analyses of the COE and TRADOC automated library support networks.

4) The ALMO should ensure that the different networks serving Army libraries can provide automated input in compatible formats to a central procurement office so that COE, TRADOC and TPC linkages can be developed.

5) If feasible, the ALMO should recommend the establishment of a DA level office to provide for (a) centralized negotiation of contracts for serials procurement Army-wide and for procurement of certain trade publisher's monographic titles, and (b) centralized procurement of basic reference works ("standing order" items) for all types of Army libraries.

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ACRONYMS

AACR2	Anglo American Cataloging Rules, 2nd edition
AEHA	U.S. Army Environmental Hygiene Agency
ALMO	Army Library Management Office
APG	Aberdeen Proving Ground
BRL	Ballistic Research Laboratory
COE	Corps of Engineers
COSATI	Committee for Scientific and Technical Information
CSL	Chemical Systems Laboratory
DARCOM	Development and Readiness Command
DTIC	Defense Technical Information Center
FEDLINK	Federal Library Information Network
FESA	Facilities Engineering Support Agency
HSC	Health Services Command
ILS	Integrated Library System
MERADCOM	Mobility Equipment Research and Development Command
OCLC	On-line Computer Library Center
OTSG	Office of the Surgeon General
SAG	Study Advisory Group
TECOM	Testing and Evaluation Command
TPC	Technical Processing Center
TRADOC	Training and Doctrine Command
TRALINET	TRADOC Library Information Network